

SCIENCE

The Main Book

By A Group of Supervisors

Contents

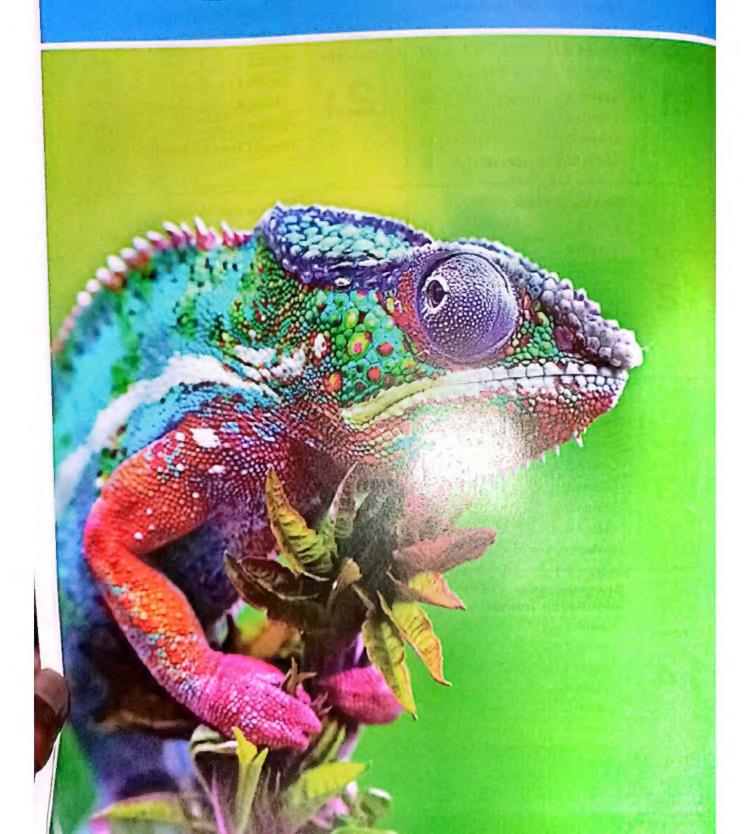
- Model Exam on concept (1.4) 202

THEME ONE: Systems THEME TWO: Matter and Energy **UNIT ONE: Living Systems UNIT TWO: Motion** Adaptation and Survival: Starting and Stopping: - Lesson 1 17 - Lesson 1 - Lesson 2 27 Concept Concept - Lesson 2 213 - Lesson 3 40 - Lesson 3 222 - Lesson 4 52 - Lesson 4 229 - Lesson 5 71 - Lesson 5 233 - Lesson 6 83 - Model Exam on concept (2.1) 238 Model Exam on concept (1.1) Senses at Work: Energy and Motion: - Lesson 1 - Lesson 1 _____ 243 - Lesson 2 105 Concept Concept - Lesson 2 249 Lesson 3 115 - Lesson 3 259 12 - Lesson 4 121 - Lesson 4 268 Lesson 5 ___ 126 - Lesson 5 271 Lesson 6 ____ _ 131 - Model Exam on concept (2.2) 276 - Model Exam on concept (1.2) . 134 Light and Sight: **Energy and Collisions:** - Lesson 1 139 - Lesson 1 ____ 281 Concept -Lesson 2 147 Concept - Lesson 2 289 - Lesson 3 152 - Lesson 3 301 1.3 - Lesson 4 156 - Lesson 4 308 - Lesson 5 165 - Lesson 5 316 - Lesson 6 166 - Lesson 6 323 - Model Exam on concept (1.3) 168 - Model Exam on concept (2.3) 324 Communication and Information Transfer: - Lesson 1 _____ 173 Concept - Lesson 2 179 - Lesson 3 - Lesson 4 189 - Lesson 5 195 - Lesson 6

Theme One: Systems

LIND

Living Systems



Get Started

What I Already Know

- There are many factors that affect the life of living organisms in their environments such as :
 - Hot and cold temperature.
- Amount of water.

- Availability of food.

- Availability of shelter.
- Overtime, animals and plants adapt or change according to the previous factors, so that they can live, eat, breathe, stay safe and so on.

Examples:

 Camel's body is covered with a special thick hairy skin to protect it from the hot weather in desert.



Camel

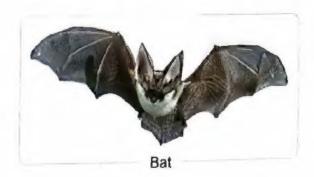
 Palm trees have strong roots to fix them in the soil against strong winds in desert

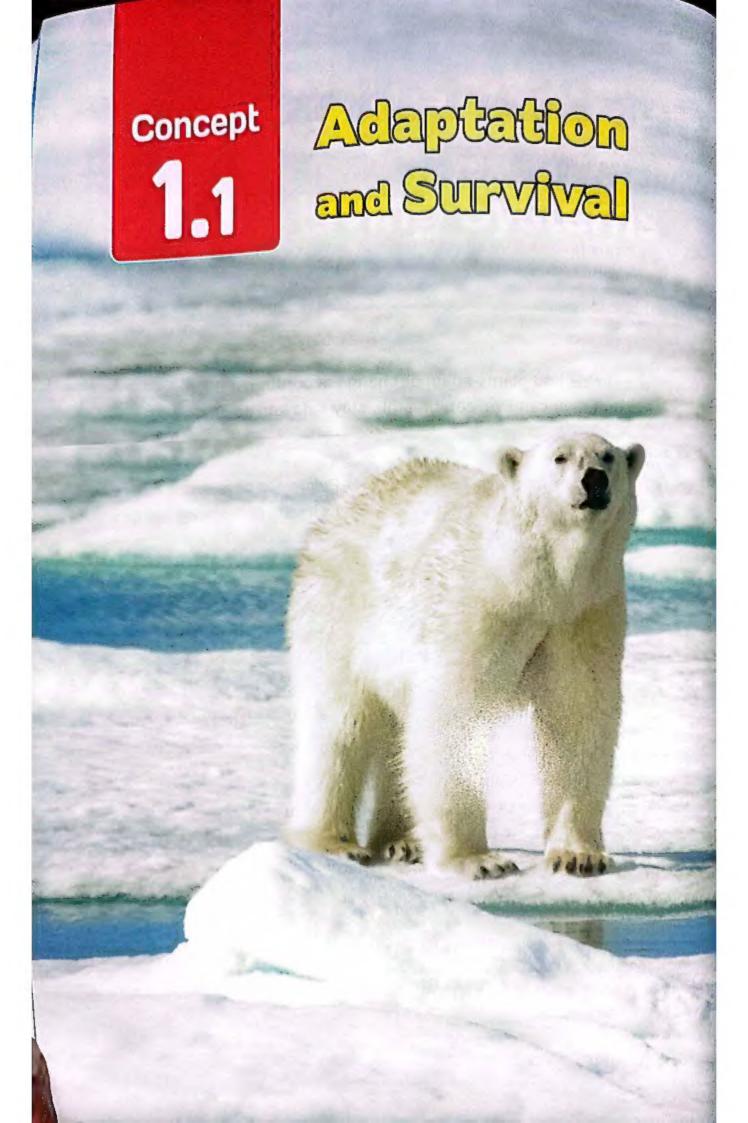


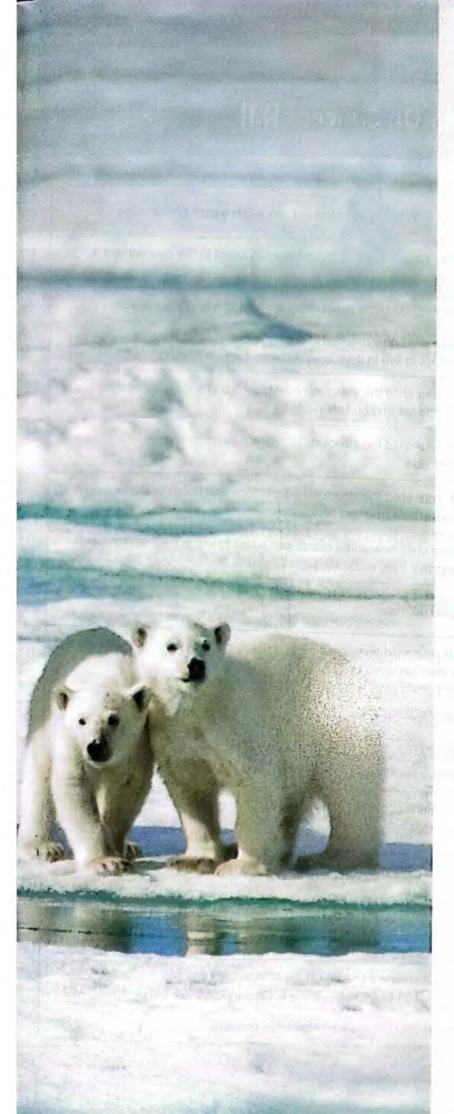
Palm tree

- In this unit, you are going to study :
 - Types of adaptations of living organisms.
 - How humans and animals use their senses to gather (collect) information.
 - Adaptations of some animals that are active at night.
- How humans and animals communicate and transfer information.
- · Unit Project : "Bat Chat"

At the end of this unit, you will make a research project about "Bats" to learn how their adaptations help them to navigate, hunt and communicate.







Learning outcomes

By the end of this concept, your child will be able to:

- Model the relationships among an organism's survival, habitat, adaptations and body systems.
- Argue from evidence that plants and animals have structures and behaviors that help them survive and grow.
- Explain how structural adaptations help organisms survive in specific environments.
- Argue from evidence that multiple adaptations or organs work together in systems to help organisms survive in specific habitats.

Key vocabulary

Adaptation

Arctic

Camouflage

Digestive system

Ecosystem

Energy

Extinct

Ocean

Organism

• Pollute

Predator

Prey

Reproduce

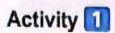
Survive

Respiratory system

Notes For Parents On Concept [1.1]

Lessons	Activities	What you should do with your child
	Activity 1	Explain to your child how living organisms can adapt to the environment in which they live.
1	Activity 2	Discuss with your child how penguins can adapt to live in polar regions.
	Activity 3	Explain to your child how different bears, caracal, fennec fox and some desert lizards can adapt to live in their environments through "camouflage".
	Activity 4	Discuss with your child the structural adaptations and behavioral adaptations of fennec fox, arctic fox and bull shark.
2	Activity 5	Discuss with your child the structural adaptations and behavioral adaptations of panther chameleon.
	Activity 6	Discuss with your child the structural adaptations and behavioral adaptations of plants such as acacia tree and kapok tree.
3	Activity 7	Explain to your child how some plants can adapt to live in their environments such as mangrove tree, water lily, palm treeetc.
	Activity 8	Optional digital activity.
	Activity 9	Discuss with your child how some organs of the human digestive system can adapt to do their functions to help the human body survive.
4	Activity 10	Optional digital activity.
	Activity 11	Discuss with your child how some organs of the human respiratory system can adapt to do their functions to help the human body survive.
	Activity 12	Let your child think about the similarities and differences between the respirator, system of humans and fish.
5	Activity 13	Discuss with your child some of the ecosystem changes that are caused by the nature and also the effect of human activities on plants, animals and humans themselves.
	Activity 14	Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation.
6	Activity 15	Let your child determine a problem in the environment and find out the best solution for this problem such as : how to protect some types of frogs from extinction.
6	Activity 16	Let your child review the main points in this concept.





Activity 1 Can You Explain?



Do you notice how each of the previous living organisms protect itself from extreme hot climate?

- 1 Starred agama lizard that lives in the desert protects itself by finding shaded area during a hot sunny day to keep its body cool.
- Palm leaves are covered with waxy layer to protect them from extreme hot climate.
- 3 Human being protects himself from extreme hot climate by using umbrella and
- ▶ Each of the previous living organisms has different ways to protect itself from extreme hot climate, and these different ways are known as "Adaptations ".

Adaptations:

They are characteristics that help living organisms to survive and reproduce in the ecosystem in which they live.

- Adaptations occur over many generations.
- In this concept, we will study:
 - Types of adaptations.

Plant adaptations.

Note

Ecosystem is an area in which living and nonliving things

interact with each other.

Human's body systems and their adaptations.

agama lizard shade area Waxy layer extreme

hot climate سحلية العجمة survive طبقة شمعية

adaptation منطقة الظل reproduce

characteristics المناخ الحار ecosystem لكيف interact بيقى حيّا generations يتكاثر

نظام بيلي يتفاعل

17

Activity Penguin Feet

▶ Look at the following pictures, then put (✓) or (×):



You can stand on ice in barefeet for about 5 minutes.



Penguin can walk on ice for a long period of time.

Climate is considered one reason for adaptation of many living organisms over generations.

Adaptation of penguins to survive in cold environment:

Unlike most birds, penguins cannot fly but they can stand on ice all day.

· Habitat :

Penguin in Antarctica lives in a polar climate that is one of the coldest places on the Earth.

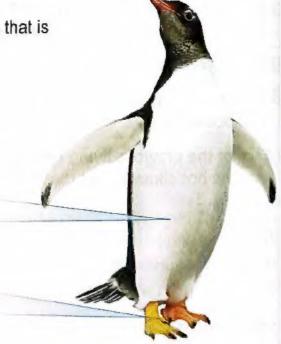
Adaptation :

Its body:

Penguin's body is covered with dense feathers and a thick layer of fat to keep its body warm.

Its feet:

Penguin's feet have no feathers.



Penguin



Habitat is the environment where living organisms live in.

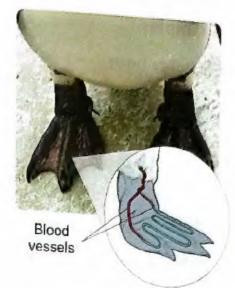
How do the penguin's feet stay warm?

The penguin's feet stay warm due to the way of moving the blood in blood vessels through its feet as follows:

Blood vessels bring cold blood up from the feet.

Other blood vessels bring warm blood down to the feet from the feather-coated body.

These vessels weave around each other.
When they touch, the warm blood vessels heat up the cold blood vessels, so the heat transfers to the penguin's feet.



 This means that the blood moving up into the penguin's body is not cold and the blood moving down to the penguin's toes is warm enough to keep its toes from freezing.



Penguins' feet help them survive in cold climate.

Because blood vessels that carry warm blood from the body weave around the blood vessels that carry cold blood from the feet. This leads to warming the blood vessels of the penguin's feet to survive in cold climate.



▶ Put (√) or (x):

- The blood vessels coming upwards from the penguin's feet carry warm blood.
- 2. Penguins can adapt to live in extreme cold environment by having feathers and fat in their feet.

Activity 3 Adaptations for Survival

Some animals have some adaptations that help them survive and reproduce in their different environments.

Examples:





Polar bear

- Habitat : Arctic region (polar region).
- Adaptation :

It has white and thick fur:

- Its white fur helps it blend in with the snow as it sneaks up on its prey.
- Its thick fur helps it stay warm in its cold arctic region.

Brown bear and black bear





Brown bear

Black bear

- · Habitat : Forests.
- Adaptation :

They have dark fur to help them hide among the trees when they hunt.

3 Caracal and fennec fox



Caracai

Fennec fox

- · Habitat : Desert
- Adaptation :

They have sandy-colored fur (tan-colored fur) to help them blend in with desert landscapes.



Some desert lizards



Desert lizard

- Habitat : Desert
- Adaptation :

They have colorful scales that make them hide among the colorful rocks in the desert.

arctic region blend caracel

landscapes

forests منطقة القطب الشمائي hunt يندمج sneak up القط البري المناظر الطبيعية

fennec fox الغابات scales يصعاد hide

علب الفنك دراشيف شد • From the previous examples, we notice that some animals adapt in many ways to hide from their predators or their preys by a way of adaptation called "camouflage".

Camouflage:

It is a type of adaptation that some animals use to hide from their predators or their preys by blending in with the surrounding environments.

Notes

- 1. Predator is an animal that hunts and eats another animal.
- 2. Prey is an animal that is hunted and eaten by another animal.





Check your understanding

- ▶ Put (√) or (x);
 - 1. Polar bear has a dark fur to blend in with the snow.
 - 2. Brown bear lives in arctic region, while polar bear lives in forest.
- ▶ Complete the following state (argin:
 - 1. Fennec fox has fur to help it blend in with desert landscapes.
 - 2. The type of adaptation that some animals use to hide from their predators or their preys is known as

In the Assessment Book: Try to answer: Self-Assessment (1)

Exercises on Lesson 1

Understand

@ Ampolin

Analyze

Evaluate

• Create

1	Choose	the	correct	answer	
---	--------	-----	---------	--------	--

c. secreting more sweat.

•	1. Adaptation helps the living organ	sm in all the following characters	except
	a. surviving.	b. reproduction.	- Hirona
	c. hiding.	d. death.	(Cairo 202
•	2. The starred agama keeps cool di	uring a hot sunny day in desert by	
	a. eating green vegetables.	b. drinking more water.	

d. finding a shaded area.

- a. minutes. b. hours. c. days. d. weeks.
- 4. Penguins live in a polar climate which
 - a. is one of the hottest places on Earth.
 - b. is one of the coldest places on Earth.
 - c. looks like the desert climate.
 - d. looks like the forest climate.
 - 5. Which of the following ways help penguins to adapt to live in polar climate?
 - a. Their bodies'are covered with skin.
 - b. Their bodies are covered with dense feathers only.
 - c. Their bodies are covered with a freek layer of fat only.
 - d. Their bodies are covered with dense feathers and a thick layer of fat.
 - 6. In penguin's feet,
 - a. warm blood vessels weave around cold blood vessels.
 - b. warm blood vessels weave around its toes.
 - c. cold blood vessels weave around its toes.
 - d. cold blood vessels weave around dense feathers.
 - 7. Penguin's feet have blood vessels that bring up from its feet towards its body.

 a. cold water b. warm water cold blood and a second blood.
 - a. cold water b. warm water c. cold blood d. warm blood

 8. The presence of a thick white fur is an address.
 - 8. The presence of a thick white fur is an adaptation in
 a. starred agama lizard.
 b. polar bear.
 - c. fennec fox. d. forest bear.

9. Bears that	live in forests have fur th	nat of polar bears.
a, whiter th	an b. dark	er than
c. similar to		nter than
10. Fennec fox landscapes	and caracal have that h	elp them blend in with desert
a. colorful s	b. thick	white fur
	olored feathers d. sand	dy-colored fur
11. Desert lizar desert.	ds have that make them	n hide among the colorful rocks in the
a, tan-color	ed fur b. color	red scales
c. sandy co	lored feathers d. dark	fur
12. Camouflage	e means that the animal	
a. can be se	een easily among its surround	ling environment.
b. is hard to	be seen among its surroundi	ng environment.
c. is easily t	o be seen by its preys.	
d. can be se	en easily by its predators.	
		di Andrea de la constanti de l
13. Which of the	e following birds is more difficu	JILIO De seen hy its prodator 2
	e following birds is more difficultion a green tree. b. A blu	
a. A red bird	on a green tree. b. A blu	e bird on a green tree.
a. A red bird c. A yellow b	on a green tree. b. A blu bird on a green tree. d. A gre	e bird on a green tree.
a. A red bird c. A yellow b	on a green tree. b. A blu	e bird on a green tree.
a. A red bird c. A yellow b	on a green tree. b. A blu bird on a green tree. d. A gre	e bird on a green tree. een bird on a green tree. hem in column (A):
a. A red bird c. A yellow b Choose from co	on a green tree. b. A blu bird on a green tree. d. A green tree. b. A blu bird on a green tree. d. A green tree. b. A blu	e bird on a green tree. een bird on a green tree. hem in column (A):
a. A red bird c. A yellow b Choose from co (A)	on a green tree. b. A blu pird on a green tree. d. A green lumns (B) and (C) what suit to (B)	e bird on a green tree. een bird on a green tree. hem in column (A):
a. A red bird c. A yellow b Choose from co (A) Animal	on a green tree. b. A blu pird on a green tree. d. A green lumns (B) and (C) what suit to (B) Adaptation	e bird on a green tree. een bird on a green tree. hem in column (A): (C) Helps it to
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin	on a green tree. b. A blu pird on a green tree. d. A green lumns (B) and (C) what suit to (B) Adaptation a. has dark fur	te bird on a green tree. teen bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal	on a green tree. b. A blu pird on a green tree. d. A green lumns (B) and (C) what suit to (B) Adaptation a. has dark fur b. has thick white fur c. has thick layer of fat and	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal 3. Brown bear	on a green tree. b. A blu pird on a green tree. d. A green lumns (B) and (C) what suit to (B) Adaptation a. has dark fur b. has thick white fur c. has thick layer of fat and dense feathers	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm C. blend in with desert landscapes D. hide among the trees when it hunts
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal 3. Brown bear 4. Polar bear 1	on a green tree. b. A blue bird on a green tree. d. A gre	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm C. blend in with desert landscapes D. hide among the trees when it hunts
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal 3. Brown bear 4. Polar bear 1 Out (V) or (X): The desert lize	on a green tree. b. A blue bird on a green tree. d. A gre	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm C. blend in with desert landscapes D. hide among the trees when it hunts 4 trees, to hide from its enemies. (
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal 3. Brown bear 4. Polar bear 1 Out (V) or (X): The desert lize Animals that lice cool during he	on a green tree. b. A blue bird on a green tree. d. A green tree tree tree tree tree tree. d. A green tree tree tree tree tree tree tree	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm C. blend in with desert landscapes D. hide among the trees when it hunts 4 trees, to hide from its enemies. (I ways to keep their bodies
a. A red bird c. A yellow b Choose from co (A) Animal 1. Penguin 2. Caracal 3. Brown bear 4. Polar bear 1 Out (V) or (X): The desert lize Animals that lice cool during he	on a green tree. b. A blue bird on a green tree. d. A green tree tree tree tree. d. A green tree tree tree tree. d. A green tree tree tree tree tree. d. A green tree tree tree tree tree tree. d. A green tree tree tree tree tree tree tree	te bird on a green tree. them in column (A): (C) Helps it to A. stay warm and hide from preys B. keep its body warm C. blend in with desert landscapes D. hide among the trees when it hunts 4 trees, to hide from its enemies. (I ways to keep their bodies

 4. Penguin's body is covered with dense its body were 	e feathers and a thin layer of fat to keep
its body warm.	opers that live in polar regions
5. Thick white fur is an adaptation in I 6. The sandy palered for af careaulty.	
 6. The sandy-colored fur of caracal he environment. 	sips it pictid iii with show iii polai
7. Some types of lizards have colored	I feathers to help them blend in with
rocks in their ecosystem.	()
4 Complete the following sentences b	
(camouflage – habitat –	adaptation - predator - prey)
 1. The environment where living orga 	nisms live in is called
	ther animal is called awhile
ls an animal that is hunte	
 3. The characteristic that helps living ecosystem is known as 	organisms to survive and reproduce in the
 4. Type of adaptation that some anim 	als use to hide from their predators or their
preys is known as	(Sharkia 2022)
5 Write the scientific term of each of	the following :
	ganisms to survive and reproduce in the
ecosystem in which they live.	()
 2. A bird that has a thick layer of fat a extreme cold weather. 	·
 3. It covers the body of some types of 	(
keeps their bodies warm.	()
• 4. A type of foxes that has sandy-col	· ·
environment.	()
 5. A property that helps animals to be 	er d in with their surrounding
environment.	(Cairo 2022) ()
6 Complete the following sentences:	
 1. The penguin's body can keep war dense 	m through a thick layer of and
 2. A penguin can stand around on ice around each other in its feet. 	e all day due to the weaving of
3. Forest bears have or or colored fur.	colored fur, while polar bears have
• 4. In desert environment,ar	nd are covered with sandy-colored fur.

5. Among animals that can live in desert ecosystem are lizard and lizard and
6. The fur of a polar bear is thick to keep its body in polar climate, while it has color to blend in with snow.
 7. The body of some types of lizards are covered with to blend in with colored rocks in their environments.
e 8. Among animals that can live in polar environment are
9. Animals can blend in with their surrounding environments to hide from their
7 Give reasons for :
 1. The starred agama lizard always looking for shade areas in desert.
and the second s
2. The penguin's body has a thick layer of fat and dense feathers.
3. The blood vessels in the penguin's feet weave around each other.
4. Some desert lizards have colorful scales.
5. Fennec fox has sandy-colored fur, while polar bear has a white fur.

6. Some animals have the ability to real and the second of the seco
6. Some animals have the ability to make camouflage adaptation.
The state of the part of the p
* Telle ((click (c. i. b.)) telle ((click (c. i. b.))) t
8 What happens if ?
The warm blood vessels and cold blood vessels in the penguin's feet do not weave around each other.

2. The polar bear has thin fur instead of its thick fur.

3.	The body	of fennec fox is covered with black fur.	
	********* 4+4 4+6	tan an a	W141 141 144 - 431
	***********		**** *** ** **

4. Some types of lizards are not able to make camouflage adaptation.

9 Compare between :

. 1

Points of comparison	Penguln	Fennec fox
1. Habitat :	6(***)****************************	
2. Body coat :	pacys reddosciiasmirrēdorspiesosos	

• 2.

Points of comparison	Polar bear	Forest bear
1. Habitat :	\$55\$26\$25555574475 444557478417 +64	· 中央的中央部件中央中央 · · · · · · · · · · · · · · · · · ·
2. Fur color :	\$5342111492206662414441788944047444	\$\$\$4\$\$74\$0482\$\$\$\$\$\$\$\$\$\$\$\$KHRANOZRA;

10 Choose the animals that use camouflage adaptation to blend in with its environment:









a. Deer

b. Frog

c. Cow

d. Lizard

LESSON

Activity 4 Types of Adaptations

▶ Look at the following pictures, then put (√) or (x);



Camel's body is covered with a special thick hairy skin to adapt to live in desert.



- Polar bear has thick white fur to adapt to live in forests. (
- In this lesson, we will study types of adaptations and explore these types in

Types of adaptations

1. Structural adaptation

2. Behavioral adaptation

Definition

It is a change in the body " of a living organism to achiet survive.

It is a change in the behaviors or acts of a living organism to help it survive.

Examples

- · The blood vessels in the penguin's feet.
- The thick fur of the polar bear.
- · Desert lizard looks for shade during hot sunny days.
- Migration of some animals towards certain regions.
- ▶ Now, we will study types of adaptations in some different animals.

1 Fennec fox:

ज्यात्वध्या

Habitat Hot dry desert Fennec fox

Structural adaptation

- It has a tan-colored coat (sandy-colored fur) that :

- provides camouflage to hide in a sandy, rocky environment.
- protects it from the hot Sun.
- It has extra-large ears to help it lose the heat to cool its body.

Behavioral adaptation

- It pants like dogs to cool its body, where it takes up to 700 breaths per minute.
- It lives in burrows to stay cool during the sunny days.
- It eats all kinds of food like insects, fruit, plant roots and even the remains from another animal's prey.

Arctic fox :

Habitat Structural adaptation Behavioral adaptation Tundra desert - It has a thick fur coat with temperature as - It lives in burrows to stay cold as (50°C) below to keep its body warm in warm at night. zero in the winter extreme cold climate. months Its fur coat is white during - It eats all kinds of food winter but turns brown in like insects, fruit, plant roots summer when the snow and even the remains from melts to help it sneak up on another animal's prey. prey in any season. Arctic fox in winter - It has short ears and legs to help it stay warm. Arctic fox in summer



The special shape of ears in both fennec and arctic foxes allow excellent hearing to help them hunt.



Both fennec fox in hot dry desert and arctic fox in cold tundra eat all kinds of foot Because it is hard to find food in the hot dry desert and in the cold tundra.

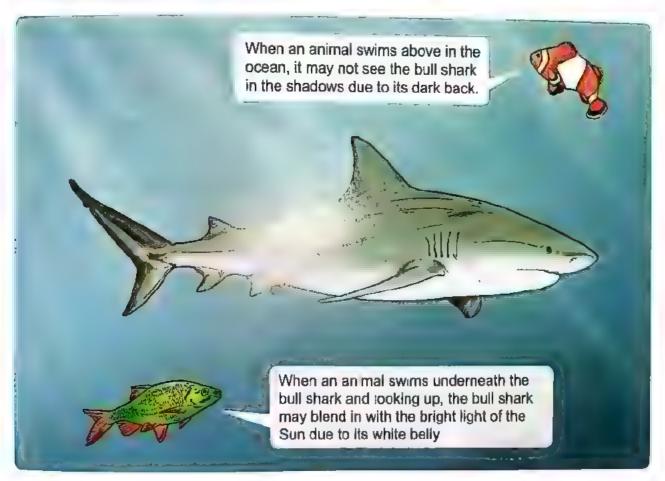
28

3 Bull shark :

Most sharks can live only in salt water but in bull sharks, their bodies have adapted to live in both fresh water and salt water.

Habitat	Structural adaptation	Behavioral adaptation
Fresh water and salt water. Bull shark	 Its body is adapted to survive in fresh water, where no other sharks live in fresh water, so it has less competition to find food. It uses a camouflage strategy called "countershading", where it has a dark back and white belly to sneak up on prey. It has sharp teeth to cut its prey's flesh. 	- It eats different types of food as it lives in both fresh water and salt water It hunts during the day and at night, so it can surprise its prey.

Countershading in bull shark:





- ▶ Write the scientific term :
 - 1. It is a change in the body structure of a living organism to help it survive.
 - 2. It is a change in the behaviors or acts of a living organism to help it survive.
- ► Use the following structural and behavioral adaptations of the following animals to complete the table below:

Hunts in day and night – Tan-colored coat – Panting – Sharp teeth – Short ears and legs – Big ears – Can live in fresh water – Camouflage by season – Countershading.

Animals	Structural adaptation	Behavioral adaptation
Fennec fox :	Strong sense of hearing.	Living in a burrow.Eat different kinds of food.
Arctic fox :	Strong sense of hearing.	Living in a burrow. Eat different kinds of food.
Bull shark :	•	Eat different kinds of food. .

Activity 5 The Panther Chameleon

- Lizards are from reptiles that are an ancient type of animals found all over the world in different environments.
- Bodies of reptiles are covered with scales such as starred agama lizard and

Adaptation of the panther chameleon to survive in its environment:

Habitat :

Tropical rainforest.

Structural adaptation:

Chameleon eyes can face opposite directions, where each eye can move independently from the other, so:

· One eye can search for food like insects, while the other eye looks out for danger in a different direction.

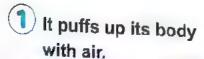
Chameleon has V-shaped feet and a tail like a hand to hold tightly the branches of trees.

Chameleon has brightly colored scales to help it make camouflage and hide between green leaves and colorful flowers.



Behavioral adaptation

- When chameleon finds it are danger, it doesn't have teeth or claws for defense, but it has one last trick to scare its enemies (attackers), where it appears as fierce as follows:





It opens its mouth wide,



It changes the colors of its scales.



lizards
reptiles
panther chameleon
independently



The panther chameleon can hunt its prey and avoid becoming a prey at the same time.

Because it can search for food with one eye, while its other eye looks out for danger in a different direction.



Check your understanding

► Complete the following table which describes the types of adaptations that help chameleon to survive :

Adaptation	Types of adaptation : Structural (S) or Behavioral (B)	This adaptation helps chameleon to	
Bright colored scales.		Camouflage to hunt and hide.	
V-shaped like feet.	*** ********* ************************	Balance and move.	
Eyes move in different directions.	APLIANCISC COCCUPATION OF THE PROPERTY CONTRACTOR SECTION	Hunt.	
Puffing up its body.		Scare its enemies.	
Changing colors.	4 pringer 9 = 1 12 30 1 p = 1500 = 124 11 120	Defend or survive.	

In the Assessment Book:
Try to answer:
Self-Assessment (2)

Exercises on Lesson 2

Analyze Understand @ Apply Evaluate • Create Choose the correct answer: 1. All of the following sentences represent the meaning of adaptation, except a, it is the characteristic that helps living things survive. b. it is the characteristic that helps living things reproduce. c. it is the change that helps the animal to find a prey. d. it is the change that causes the death of the animal. 2. The color of fur of fennec fox protects it from a. wind. b. rains. c. hot climate. d, cold weather. 3. Fennec fox has a tan-colored coat that provides in its environment. b. respiration c. panting d. communication • 4. Panting in fennec fox belongs to adaptation. a. only structural b. only behavioral (Fayoum 2022) c. both structural and behavioral d. neither structural nor behavioral • 5. Fennec fox and arctic fox live in burrows, this belongs to adaptation. b, only behavioral c. both structural and behavioral d. neither structural nor behavioral b. make panting, c. tan-colored coat. d. extra-large ears. 7. Changing the color of body coat of arctic fox according to season, is a. behavioral adaptation. b. changing the way of breathing. c. structural adaptation. d, changing the way of drinking. • 8. All of the following properties help arctic fox to stay warm, except b. short ears, c. tan-colored coat. d. short legs. 9. Both fennec fox and arctic fox are similar in all of the following, except ... (Qena 2022)

a. they live in the same habitat.

b. they can eat different things.

d. they have different sized ears.

c. they have excellent hearing ability.

	Malt 1 Courte detroit	
	c. seas, rivers and mud.	salt water only. rivers, seas and oceans.
	 11. One of structural adaptations of bull salt can live in both salt water and fresh b. are flexible about what they eat. c. hunt in the day as well as the night d. can live in salt water only. 	, water.
	a. witte	green olack
	13. Special eyes of the panther chameled a. only structural b. c. both structural and behavioral d. r. 14 is considered as a behavioral and behavioral a	neither structural nor behavioral
•	 14 is considered as a behavioral at a. Puffing up its body during danger b. Each eye can move independently c. V-shaped feet d. Tail like a hand 	

- 15. All the following are structural adaptations in the panther chameleon, except
 - a. each eye can move independently.
 - b. openning its mouth wide during danger.
 - c. its V-shaped feet.
 - d. its tail like a hand.

2 Choose from columns (B) and (C) what same them in column (A):

(B) Adaptation	(C) Helps it to
a. short ears and legs	A. stay cool
b. V-shaped feet	B. stay warm
c. change body colors	C. balance and move
d. panting	D. hide from its prey
	Adaptation a. short ears and legs b. V-shaped feet c. change body colors

3			
-	Living organisms can adapt their environmental conditions through structural adaptation and behavioral adaptation. (Menolia 202)		
•	2. The behavioral adaptation is a change in the body structure of a living organism to survive.	2) ()
•	When the snow melts in polar regions, the thick fur coat of arctic fox turns black.	()
	4. The ears of arctic fox are larger than those of fennec fox.	()
•	5. Fennec fox stays in burrows during day, while arctic fox stays in burrows at night.	()
•	Both fennec and arctic foxes can eat insects, fruit, plant roots and the remains from other animal's prey.	(,
	7. Fennec fox has sandy-colored fur to help it make camouflage.	()
	8. Arctic fox lives in tundra, while fennec fox lives in hot desert.	()
•	Panting and staying in burrows are considered behavioral adaptations	()
	in fennec fox.	()
6	10. All types of sharks live in fresh water.	()
•	11. If a bull shark moves from a river to a sea, it will die.	()
•	12. Bull shark uses countershading camouflage to sneak up on its prey.	()
•	13. Chameleon uses its tail and V-shaped feet to hunt and move.	i)
•	14. The panther chameleon has teeth and claws, through which it can hunt	,	
	and eat its prey.	-{)
	15. Starred agama lizard use one of its eyes for searching for food and the other one to look out for danger.	1	ì
		- 1	- /

4 Complete the following table :

Animal	⁴aptation	Structural or Behaviora adaptation	
1	Has blond vessels weave around each other.	* *************************************	
2. Polar bear	Has thick white fur.	Structural	
3 fox	Changes the color of its fur.		
4 fox	Hiding inside burrows to stay cool.		
5. Panther chameleon	Has eyes face opposite directions.	69688864154786478787844	

■ Understand

(Behira 201

Write the scientific term of each of the following:	
1 A change in the body structure of a living organism to survive.	(
2. A change in the behaviors or acts of a living organism to survive.	(
3. An animal has a tan-colored fur and panting like dogs.	(
4. A way by which fennec fox cools itself like dogs.	(
4. Away by which refined lox cools hetween winter and summer	
5. An animal that changes its fur color between winter and summer	(** *********************************
 Seasons. 6. A lizard that has multiple bright colored scales to provide camoufic 	
in its environment and has V-shaped feet.	(,
 7. A shape of feet by which a panther chameleon holds tightly to bra 	nches
of trees.	(
8. A feature in the bull shark, in which the upper surface of its body it.	S
darker than its lower surface.	**********
dantor may no format	
6 Complete the following sentences:	
1. Weaving of blood vessels around each other in penguin's feet is	considered
adaptation, while migration of birds to certain regions in	s considered
adaptation.	(Assiut 20
 2. Tan-colored coat in fennec fox is considered adaptatio 	n, while its
panting to stay cool is considered adaptation.	
3. Among animals that live in hot environments are foxes	is
while foxes live in cold environments.	
4. Extra-large ears allow heat to escape to cool the bodies of	foxes,
while short ears and legs help the foxes stay warm.	
	ite etav no
5. Short ears of arctic fox is considered	1(3 010) - 3
burrows to be warm is considered adaptation.	t -:-bt o⊓i
6. A burrow is an excellent place for the fox to stay warm	at night and
for the fox to stay cool during the day.	
7. The fur color of arctic fox is In winter but turns	
8. The chance of bull shark to find a prey is more easier in	water tha
in water.	
Countershading strategy of the bull shark is considered.	ndantatio!

10. Eyes of chameleon move independently of each other, this is considered

as adaptation.

2. Fennec fox undergoes panting. 3. Arctic fox has a thick fur coat. 4. The fur of arctic fox is white during winter but it turns brown in summer. 5. Burrow is an excellent place for arctic and fennec foxes. 6. Fennec fox has extra-large ears, while arctic fox has short ears. 7. Bull sharks have less competition for finding food in fresh water. 8. Panther chameleon has V-shaped feet and a long tail. What happens if? 1. Arctic fox has a brown coat during winter but it turns white during summer. 2. Fennec fox has short ears.	Give reasons for :
 Arctic fox has a thick fur coat. The fur of arctic fox is white during winter but it turns brown in summer. Burrow is an excellent place for arctic and fennec foxes. Fennec fox has extra-large ears, while arctic fox has short ears. Bull sharks have less competition for finding food in fresh water. Panther chameleon has V-shaped feet and a long tail. What happens if? Arctic fox has a brown coat during winter but it turns white during summer. Fennec fox has short ears. Sense of hearing becomes weak in foxes. 	1. Fennec fox has a tan-colored coat,
 Arctic fox has a thick fur coat. The fur of arctic fox is white during winter but it turns brown in summer. Burrow is an excellent place for arctic and fennec foxes. Fennec fox has extra-large ears, while arctic fox has short ears. Bull sharks have less competition for finding food in fresh water. Panther chameleon has V-shaped feet and a long tail. What happens if? Arctic fox has a brown coat during winter but it turns white during summer. Fennec fox has short ears. Sense of hearing becomes weak in foxes. 	
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 Burrow is an excellent place for arctic and fennec foxes. Fennec fox has extra-large ears, while arctic fox has short ears. Bull sharks have less competition for finding food in fresh water. Panther chameleon has V-shaped feet and a long tail. What happens if? Arctic fox has a brown coat during winter but it turns white during summer. Fennec fox has short ears. Sense of hearing becomes weak in foxes. 	4. The fur of arctic fox is white during winter but it turns brown in summer.
 Fennec fox has extra-large ears, while arctic fox has short ears. Bull sharks have less competition for finding food in fresh water. Panther chameleon has V-shaped feet and a long tail. What happens if? Arctic fox has a brown coat during winter but it turns white during summer. Fennec fox has short ears. Sense of hearing becomes weak in foxes. 	
8. Panther chameleon has V-shaped feet and a long tail. What happens if? 1. Arctic fox has a brown coat during winter but it turns white during summer. 2. Fennec fox has short ears. 3. Sense of hearing becomes weak in foxes.	
What happens if? 1. Arctic fox has a brown coat during winter but it turns white during summer. 2. Fennec fox has short ears. 3. Sense of hearing becomes weak in foxes.	7. Bull sharks have less competition for finding food in fresh water.
Arctic fox has a brown coat during winter but it turns white during summer. Fennec fox has short ears. 3. Sense of hearing becomes weak in foxes.	8. Panther chameleon has V-shaped feet and a long tail.
Fennec fox has short ears. Sense of hearing becomes weak in foxes.	
3. Sense of hearing becomes weak in foxes.	1. Arctic fox has a brown coat during winter but it turns white during summer
	2. Fennec fox has short ears.
4. Arctic fox has only a white coat during all seasons of the year.	

13 Look at the following figures, then answer the questions:







Figure (2)

1. W	hat is the name of this animal and where does this animal live?
an	gure (1) represents this animal in season, while figure (2) represents this imal in season.
	ny does the fur color of this animal change between summer and winter asons?
to	ention one structural adaptation and one behavioral adaptation in this animal adapt and survive in its environment:
	tructural adaptation:

▶ Look at the opposite picture, then put (√) or (x):

- 1. Cactus plant is adapted to grow and survive in rainforest habitat.
- 2. Plants have structural and behavioral adaptations like animals to be able to survive in different environments.



Cactus plant

- Plants can grow in every place that sunlight shines, even the bottom of sea ice in polar regions has tiny plants growing on it.
- Like animals, plants have structural and behavioral adaptations that help them survive and grow in their different environments.
- Now, we will study two different terrific trees that grow in two different environments which are Savannah forest and Amazon rainforest.

Savannah

Such as Southern African Savannah.

- It is a grassland habitat with a mild temperature.
- It is characterized by extreme lack of water during the dry season which lasts for half of the year without rainfall.
- There is one large tree can be seen scattered throughout the landscape which is Acacia tree (umbrella-shaped tree).

Amazon rainforest

Such as Amazon rainforest of Brazil.

- It is rainy most of the year, so it is easy to find water.
- It is characterized by strong winds.
- There is a tree that can be seen emerged high above other trees which is Kapok tree (umbrella-shaped tree).

♥ Notes

- 1. In the Savannah grassland, most large plants cannot grow due to drought conditions as the dry season lasts half of the year.
- 2. In the Amazon rainforest, it is hard for plants to reach sunlight due to the extra talk trees growing up to 70 meters tall.

Adaptation of the two different terrific trees to survive in their different environments:

1 Acacia tree (umbrella-shaped tree)

- Acacia is adapted to survive through many months of drought in its environment as follows:
- Habitat :

Southern African Savannah.

Structural adaptation :

Leaves

- Tiny leaves grow on the top of the tree to help them hold in water, while soaking up (absorbing) sunlight needed to make food.
- There are sharp spines around the leaves to prevent animals from eating these leaves.



- A very long trunk, so most animals except giraffe cannot reach its leaves to feed on.



Acacia tree



Leaves of Acadia tree



The trunk in acacia tree stores water as the hump in the camel stores fat.

Root

- A very long root called ... that grows directly downward to search for water as deep as 35 meters below the soil surface.
- Behavioral adaptation :

Acacia tree can defend itself as follows:

- It produces a poison when an animal begins eating its leaves to make the leaves taste very bad to keep this animal away.
- It sends a smelly message in the wind to warn other acadia trees nearby telling them to start making the same polson.

Kapok tree (umbrella-shaped tree)

 Kapok is adapted to survive in its environment through structural and behavioral adaptations as follows:

Habitat :

Amazon rainforest of Brazil.

Structural adaptation :

Leaves

Hand-shaped leaves with narrow parts to allow wind to move more gently through the leaves without tearing them.

Roots

- Large, wide roots called buttress roots.
- Buttress roots are not planted deeply in the ground but they grow high up on its trunk to hold the tree firmly in the soggy soil (wet muddy soil).



Buttress roots can start up to 5 meters above the ground.

Behavioral adaptation :

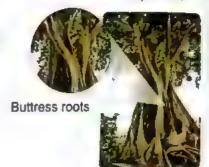
- Kapok tree has delicious-smelling flowers to send messages through wind to attract bats towards it.
- Kapok tree has fluffy yellow seeds to be easily carried by wind across the forest.



Kapok tree



Leaves of kapok tree



Buttress roots of kapok tree



Kapok seeds



Check your understanding

Choose the correct answer:

- 1. Sending a smelly message from acacia tree to warn other acacia trees is considered adaptation.
 - a. only structural

b. only behavioral

يلطف

- c. both structural and behavioral
- d. neither structural nor behavioral
- 2. A structural adaptation of kapok tree is that
 - a. it has fluffy yellow seeds.
- b. It has buttress roots.
- c. it has sharp spines around its leaves. d. it has a taproot.

Activity | Plant Scientist

- The scientist who studies plants is known as "botanist".
- Plants have different properties that help them to adapt and survive in their different environments through their structural adaptations as we will study in the following examples:

Plant	Habitat	Structural adaptation	Reason
Mangrove tree	Salt water	It has long and strong roots.	To resist the water • waves.
Water lily	Wetland (Fresh water)	It has wide floating leaves.	To absorb a large amount of sunlight.
Pine tree	Snow	The pine tree has: - a triangular shape and short branches needle leaves.	 To allow the snow to slide easily over it, so its branches don't break. To prevent the loss of water.
Palm tree	Desert	- It has thick roots and small leaves.	To resist the strong winds.



It has sharp spines and Desert tough outer cover.

To prevent animals from eating its leaves and fruits.

▶ From the previous table, we can conclude that :

- All plants have roots, stems (trunks) and leaves.
- · Plants differ in the structure and shape of their roots, stems and leaves to adapt the environmental conditions to survive and grow in their environments.



Plants were placed in different environment.

These plants may die or may adapt the new environmental conditions to survive and grow in their new environments.



•	Put	(1)	or	(x)	•
	rut	(V)	UI.	$\langle \gamma \rangle$	

 Palm tree has short roots and big leaves. 	(- 1
2. Water lily plant lives in salt water.	()
3. Mangrove tree has long and strong roots to help the plant to resist		
the water waves.	()



Optional Digital Activity

Activity [8] " Identifying Adaptations " in the school book is an optional digital activity. You can do this avtivity by scanning its QR cod found in your school book.

> In the Assessment Book: Try to answer: Self-Assessment (3)

Exercises on Lesson 3

● Understand	@Apply	● Analyze	Evaluate	• Create
1 Chassa the co	rrect answer :			
		11. 641. 641.		
	characterized by a			
	ssland habitat.		most of the year.	
	ild temperature.		reme lack of water.	
	for rainforest plants			
a. water.		b. wind.		
c. sunlight.		d. oxygen.		
	ehavioral adaptation	ns of acacia tre	e is that	
	very long root.			
b. it has sha	rp spines around its	leaves.		
c. it has very				
d. it produce	s a poison to make l	bad tasty leave	S.	
4. Acacia tree t	runk and camel hum	np,		
a. both store	water.			
b. both store	fat.			
c. the first sto	ores fat and the seco	ond stores water	er.	
d. the first sto	ores water and the s	econd stores fa	at.	
	owing properties pro	tect acacia leav	ves from being eate	n by
	ept that		•	(Minia 2022)
a. they are hi		-	urrounded by sharp	spines.
		d. they produ		
	ee warns the other r	nearby acacia t	rees from animals	
by sending				
	essage in the air.	*	nessage in the wate	
	essage in the air.	· · · · · · · · · · · · · · · · · · ·	_	
	arby acacia trees re xposed to be eaten			e acacia
a. lose water t	from their trunks.			
b. invite bats t	o eat their leaves.			
c. make a pois	sonous substance ir	their leaves.		
d. fall down th	eir leaves.			

- a. produce poison.
- b. gather their branches high above.
- c. have delicious-smelling flowers.
- d. have sharp spines.
- 15. Desert plants are characterized by all of the following, except that they.
 - a. store water.

b. have wide leaves.

c. have long roots.

- d. have sharp spines,
- 16. Palm tree has tiny leaves like
 - a. pine tree.

b. kapok tree.

c. acacia tree.

- d. water lily plant.
- 17. One of the structural adaptations of water lily plant is that

(Giza 2022

a. it has long roots.

b. it has sharp spines.

c. it has tiny leaves.

d. it has wide leaves.

•	18. Mangrove tree has lon	g and strong roots to		
	a. resist the strong win			
	c. prevent the loss of w	vater. d. absorb the underground water.		
•	19. Pine tree has a triangu	lar shape to make snow slides over its branches		
	without breaking it. Thi	s structural adaptation makes this tree face the ϵ	extre	me
	cold climate like the fe	et of		
	a. caracal,	b. penguin.		
	c. fennec fox.	d. brown bear.		
•		hals away like acacia trees by its		
	a. sharp spines.	b. poison.		
	c. smell,	d. long leaves.		
2	Choose from column (B) v	vhat suits it in column (A) :		
		That sails it in column (A) .		
	(A)	(B)		
	1. Long and strong roots	a. prevent animals from eating barbary fig.		_
2. Wide leaves b. make mangrove tree res		 b. make mangrove tree resists the water waves c. carries the kapok tree's fluffy yellow seeds at 	Toes	
	3. Needle shaped leaves	the forest.		
	4. Sharp spines	 d. allow wind to move more gently through the I of kapok tree. 	eave	s
	5. Hand-shaped leaves	e. allow water lilies absorb large amount of sun f. prevent the loss of water in pine tree.	light.	
	1 2	3 4 5		
3	Put (v') or (x):			
0	Plants have structural are in different environments	daptation only to help them survive and grow		
•		hs in Southern African Savannah.	2) {)
•			()
•	4. Acacia leaves are proto	ee grows deeply downward searching for water.	()
	brightly colored leaves.	cted from being eaten by animals as they have	,	
•		ree use wind to send messages.	,)
•		s-smelling flowers to attract bats towards it.	(7
•		kapok tree is considered as a behavioral	,)
	adaptation.		()

Understand

•	8.	The transfer of kapok tree fluffy yellow seeds by wind across the raint is considered as a behavioral adaptation.	orest
•	9,	One of the structural adaptations of acacia tree is that it has a larg roots called buttress roots.	e, wide
•	10.	Mangrove trees adapt to resist the water waves through their long, roots. (Shark)	strong (
•	11,	Water lily has wide leaves to absorb a large amount of sunlight.	1
•		Pine trees that live in desert habitat have needle leaves to prevent loss of water.	the (
•	13.	Having thick roots are behavioral adaptation of palm trees to resist winds.	strong (
•	14.	Animals can't eat barbary fig due to its sharp spines.	(
0	15.	Plants of dry desert habitat adapt to store water.	ì
•		Some plants have sharp spines to absorb a large amount of sunlig	ht. (
4	Wi	rite the scientific term of each of the following :	
•		A tree that grows in Southern African Savannah and it has sharp spines around its leaves.	ſ
•	2	. A structural adaptation of acacia tree that allows it to search for wate	F
		, and the second of the second	···
•	3	. A structural adaptation that surrounds the leaves of acacia tree to panimals from eating them.	orevent
•	4	. A tree that grows in Amazon rainforest of Brazil and it has hand-shaped leaves.	(
•	5	. A structural adaptation that fixes the kapok tree in soggy soil and support its trunk.	(
•	6	i. The part of the kapok tree which is supported by the buttress roots.	(
•	7	'. A tree lives in salt water habitat and has long, strong roots to resist the water waves.	(
•	8	A plant lives in wetland habitat and it has wide leaves to absorb a large amount of sunlight.	(
•	9	9. A structural adaptation in water lilles that helps them absorb a large	amount
		of sunlight.	(
•	10). A structural adaptation that prevents the loss of water in the pine tr	ee.

5		omplete the following sentences :
ė	1.	Acacia tree defends itself by producing that makes leaves taste
		terrible, write chameleon defends itself by puffing up its with air
•	2.	Kapok tree grows in Amazon rainforest habitat which has soil
•	3.	The hand-shaped leaves of kapok tree allow to flow through them gently.
•	4.	The kapok tree spreads the smell of its flowers to attract towards it.
۰	5.	Among the plants that can survive in habitats that have lackage of water are
•	6.	The leaves of tree in hot weather habitat store water, while the needle leaves of tree in snowy habitat prevent the loss of water.
•	7.	The leaves of water lilies are wide in order to on the water surface and to absorb a large amount of
		Drought regions are characterized by lacking of so, their plants adapt by having very long
1	9.	The structural adaptation of tree can resist water waves, while the structural adaptation of tree can resist strong winds.
•	10.	The leaves of plant allow it to absorb a large amount of sunlight, while the leaves of tree allow wind to move easily through these leaves without tearing them.
6	G	ive reasons for :
•	1.	Branches of acacia tree gather on the top of its trunk.
		* * * * * * * * * * * * * * * * * * *
•	2.	Acacia tree has sharp spines around its leaves.
•	3.	Wind is important to acacia tree.
		Many and at at a section with an analysis and a section of the sec

•	4.	Kapok tree has hand-shaped leaves.
	5	Kanak trans atou firmly mental to the
_	J,	Kapok trees stay firmly rooted in the soggy soil although they are very tall.

Understand

6. Pine tree has a triangular shape and short branches.	
• 7. Water lilies have wide floating leaves.	
8. Mangrove tree has long and strong roots.	· • • • • • • • • • • • • • • • • • • •
9. Palm trees have thick roots and small leaves.	
•10. Barbary fig has sharp spines.	
What happens if? 1. The length of acacia taproot doesn't exceed 3 meters downward	
The acacia leaves are not guarded by sharp spines.	
3. There are no buttress roots in the kapok best	
4. The pine tree has an umbrella shape not a triangle shape.	
5. Some plants of rainforest habitat became very short.	***************************************
6. Water lily has narrow leaves instead of wide leaves.	
7. Palm tree has thin roots and large leaves.	
8 Cross out the odd word:	
 Taproot – Tiny leaves – Buttress roots – Producing a poison. 	(, ,
2. Taproot - Hand-shaped leaves - Soggy soil - Buttress roots.	(
3. Cactus plant - Barbary fig - Palm tree - Mangrove tree.	(
4. Acacia tree - Polar bear - Penguin - Pine tree.	

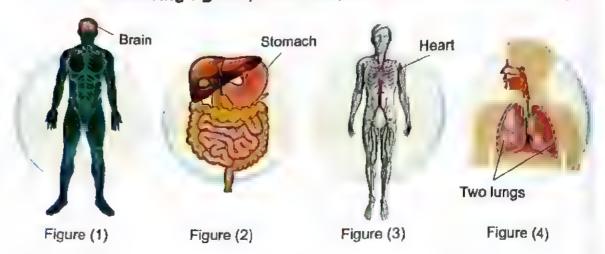
Points of comparison	Acacia t	788	Ka	apok tree
1. Type of roots :	*** *** ******* ,	, , , , , , , , , , , , , , , , , , ,		
2. Shape of leaves :	*****		> 1411	**************
Points of comparison	Kapok tree	Water lily	plant	Pine tree
I. Habitat :	*****	111111111111111111111111111111111111111		****** ******* ****
2. Shape of leaves :	0001117000001A010101AA0004			
Water lilies live in desert surface to absorb a large Plants of desert habitat habitat water waves and search Pine trees live in Savann leaves which prevent the	amount of water nave thick and shape for water such a	have wide root. ort roots to reas pine trees a	ots that f	float on the wa
Water lilies live in desert surface to absorb a large Plants of desert habitat habitat habitat water waves and search Pine trees live in Savann leaves which prevent the assify the following living in deserts and organism arred agama lizard – Par	habitat, so they amount of water amount of water such a for water such a plant from lo organisms and organisms and their chameleon	er. ort roots to reas pine trees and to their in the table have long	esist the and barb	strong pary fig plant. s and needle
Water lilies live in desert surface to absorb a large Plants of desert habitat habitat water waves and search Pine trees live in Savann	habitat, so they amount of water amount of water such a for water such a habitat, so the plant from le continue in forests other chameleon int)	er. ort roots to reas pine trees are have long to their in the table to be a few and the	esist the and barb branche habitatoelow:	strong pary fig plant. s and needle s into organis
Water lilies live in desert surface to absorb a large Plants of desert habitat habitat habitat water waves and search Pine trees live in Savann leaves which prevent the assify the following living in deserts and organism arred agama lizard — Paralm tree — Barbary fig plant	habitat, so they amount of water amount of water such a for water such a habitat, so the plant from le continue in forests other chameleon int)	er. ort roots to reas pine trees are have long to their in the table to be a few and the	esist the and barb branche habitatoelow:	strong pary fig plant. s and needle
Water lilies live in desert surface to absorb a large Plants of desert habitat habitat habitat water waves and search Pine trees live in Savann leaves which prevent the assify the following living in deserts and organism arred agama lizard – Paralm tree – Barbary fig plant	habitat, so they amount of water amount of water such a for water such a habitat, so the plant from le continue in forests other chameleon int)	er. ort roots to reas pine trees are have long to their in the table to be a few and the	esist the and barb branche habitatoelow:	strong pary fig plant. s and needle







Look at the following figures, then complete the sentences below:



1. Figure

represents the human digestive system.

2. Figure .

represents the human respiratory system.

How do body systems adapt to meet the needs of living organisms

- Each living organism has different ways to adapt to live in its environment si
 - The body of a living organism (human or animal) is made up of systems such digestive system, respiratory system, nervous system, etc.

System:

It is a group of organs that work together to person a specific job (function).



Digestive system and respiratory system are working together to get energy from food and breathing.

In this lesson, we will study :

- Human digestive system.
- · Digestive systems of different animals.
- Human respiratory system.

brain stomach heart two lungs

epecific Job digestive system المعدة organs القلب energy الرئتين

breathing وظيفة محددة nervous system الجهاز الهضمي respiratory system طافة

• Why do we need to eat food?

Because food contains different nutrients (vitamins, proteins, etc.) that give us energy to :

- do activities as walking, talking and even during sleeping.
- do body functions as heart beating, breathing and thinking.

Note

- In one day, your body needs a lot of energy, so:
 - your heart beats around 100,000 times.
- you breathe over 20.000 times.

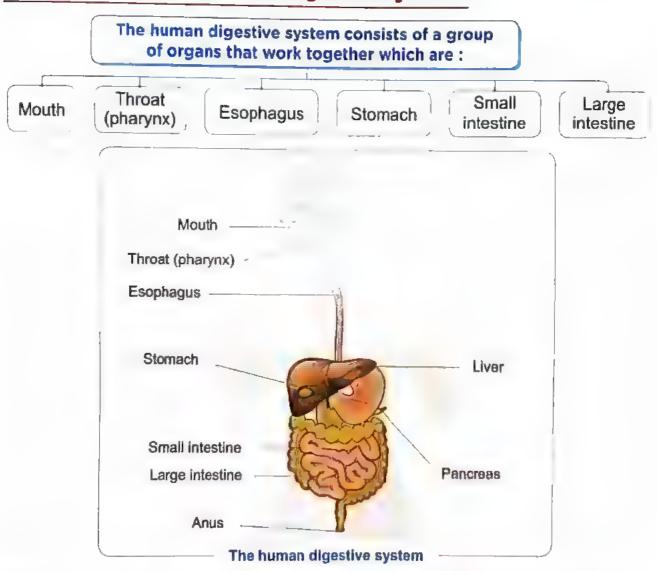
Human digestive system:

 The digestive system breaks down food into smaller parts that your body can use in a process called digestion process.

Digestion process:

It is a process of breaking down food into smaller parts that the body cells absorb and use them to get energy and growth.

The structure of the human digestive system:



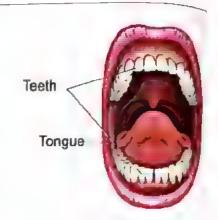
Note

Digestive system starts with mouth and ends with anus.

Description and function of organs of human digestive system

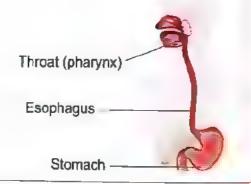
Mouth

- Digestion process begins in the mouth.
- Mouth contains :
 - Teeth: They crush food during chewing
 - Sallva: It is a liquid substance in the mouth.
 - It moistens food and begins to break it down.
 - Tongue: It mixes food with saliva in the mouth.



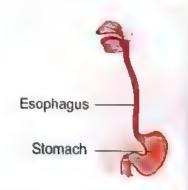
Esophagus

- It is a long muscular tube.
- It allows the food to move from throat down into the stomach.



Stomach

- · It is a muscular organ.
- It mixes food with the stomach acid and digestive juices (enzymes) found in it to change the food into a soupy liquid.
- Food stays in the stomach for few hours, then the muscles of the stomach move the food into a long, winding tube called small intestine.

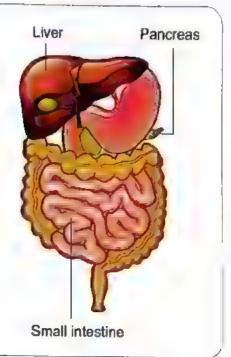


description saliva long muscular tube muscular organ stomach acld وصف atomach acld enzymes اللُحاب function substance

crush حمض لمعدة chew الزيمات digestive juices moisten حق مغ ^{ما}ران هضمر لنا

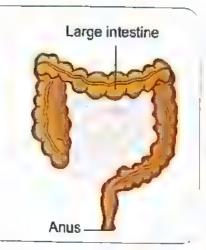
Small intestine

- It is a long, winding tube as its length is more than six meters.
- The juices of pancreas and liver flow into the small intestine and help in breaking down the food into nutrients (or digested food).
 - The walls of the small intestine absorb these nutrients through tiny blood vessels to carry them to all body parts.
- The body does not benefit from some parts of food known as undigested materials that flow into the large intestine.



Large intestine

- It is a tube that starts from the end of the small intestine and ends with the anus.
- It absorbs water from the undigested materials, so they become solid wastes that leave the body through the anus.



♥Note

The properties of all organs of the human digestive system are considered as structural adaptations.



One of the organs of the digestive system is absent.

The digestive system could not do its function correctly.

► Comparison between what the functions of the stomach, small intesting and large intestine:

The stomach	The small intestine	The large intestine
Stomach mixes food with the acid and digestive juices to change it into a soupy liquid.	The juices of liver and pancreas that flow into the small intestine help in breaking down food into nutrients.	Large intestine absorbs the water from undigested materials, so no digestion occurs in large intestine.



How can you keep the digestive system healthy?

- 1. Drinking a lot amount of water.
- 2. Chewing the food well.
- 3. Don't eat much fast meals.



Check your understanding

▶ Put each of the following words in front of its suitable sentence :

(Stomach - Large intestine - Digestive system)

- 1. It mixes food with acid and digestive juices.
- 2. A system that breaks down food into smaller parts.
- 3. It absorbs water from the undigested material ...



Optional Digital Activity

Activity 10 " Body Systems " in the school people optional digital activity. You can do this activity by scanning its QR code found in your scan of book.



Activity 11 Respiratory System

Human respiratory system:

- Our bodies need oxygen in order to do their functions.
- We get oxygen gas from the air around us all the time.
- We cannot store extra oxygen in our bodies, so we must constantly take in new oxygen.
- The respiratory system is the system responsible for breathing (respiration).
- The respiratory system supplies the body with oxygen gas and gets rid of carbon dioxide gas through the respiration process.



Respiration process:

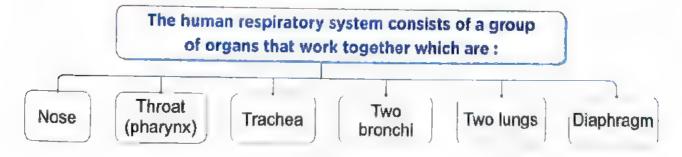
It is a process of pulling air in (inhalation) and pushing air out (exhalation) of the body.

V Note

Carbon dioxide gas which is produced during respiration process is a waste product. This gas is harmful to our bodies so, we must expel it out during exhalation.

The structure of the humes

wory system:

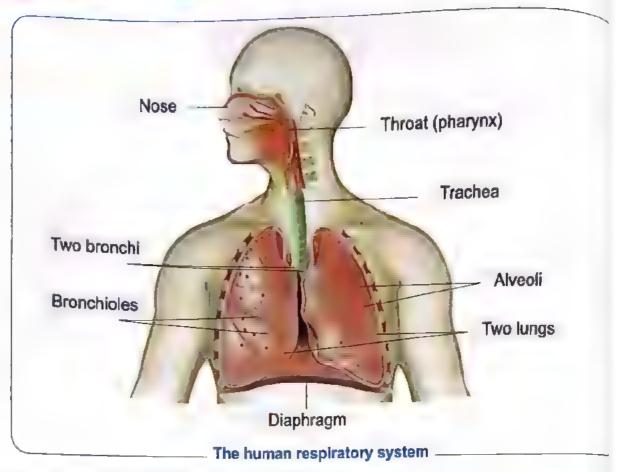


constantly exhalation harmful DOSE

trachea باستمرار inhalation وفير get rid of ضار

expel out القصية الهوائية died two bronch! diaphragm يتخلص من

الشعبتان الهواليتان الحجاب الحجز



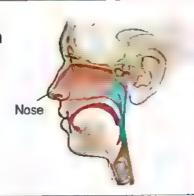
How does the respiratory system work?

Nose:

It is the first organ of the respiratory system through which the air enters the body.

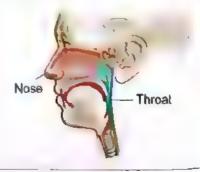
Note

The air can enter the body that you are and the mouth.



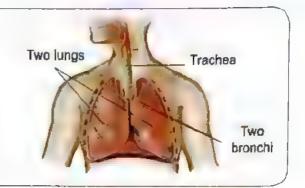
Throat:

It allows the air to pass from the nose to the "trachea"



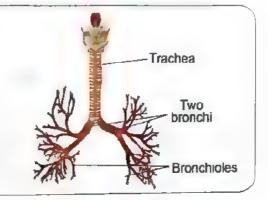
Trachea:

- It is a tube that allows air to pass into the "two lungs" which fill up with air like two balloons.
- Inside the lungs, the trachea is branched into two tubes known as "two bronchi"



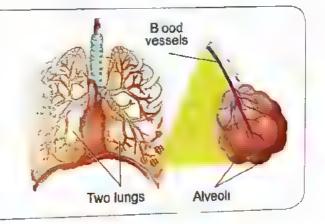
Two bronchi:

- They allow the air to enter the two lungs.
- They are divided into smaller and smaller tubes that look like the branches of a tree known as "bronchioles".



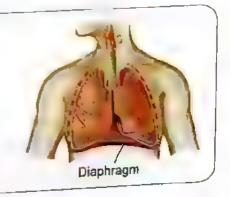
Two lungs

- Inside the lungs, the bronchioles end with little air sacs, surrounded by blood vessels known as "alveoli".
- Inside the blood vessels, oxygen into the blood which carries oxygen around the body to help other organs and systems to work.



Diaphragm:

 It is a large muscle at the base of ribs which plays an important role in inhalation and exhalation.



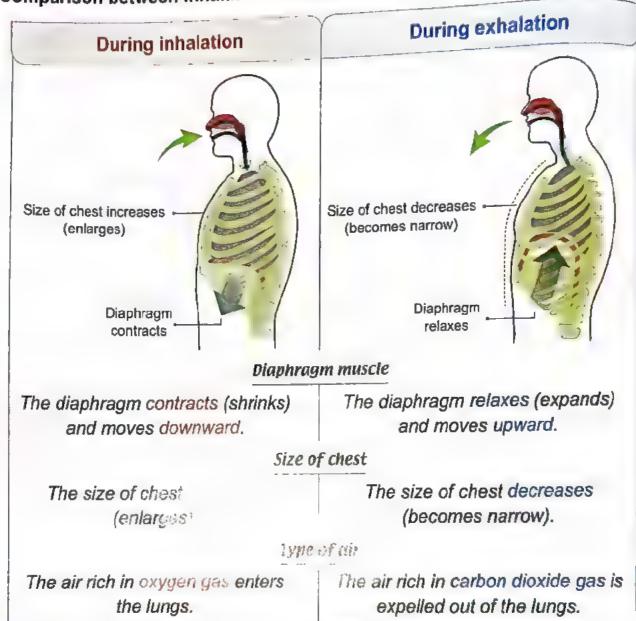


The properties of all organs of the human respiratory system are considered as structural adaptations.

How does the respiration process take place?

Respiration process includes :

- 1. Inhalation (breathe in).
- 2. Exhalation (breathe out).
- Comparison between inhalation and exhalation :



Explain ?

How does the respiratory system get oxygen to the body cells?

Oxygen enters the lungs during inhalation, then the blood carries oxygen to all the body cells.



We can't hold our breath for a very long time.

Because we can't inhale oxygen and expel out carbon dioxide so, the body can't perform its vital processes.

Note

How can you keep the respiratory system healthy?

- 1. Breathing clean air.
- 2. Eating fruits rich in vitamin (C) such as orange and guave.
- Avoiding smoking and smoking areas.

Check your understanding

Put (✓) or (⊁):

- During inhalation, the diaphragm muscle relaxes and moves downward. (
- 2. Respiration process is the process by which the human obtains energy from burning of the digested food.)

Complete:

- 1. Respiration process includes
- 2. The process of pulling air in and pushing air out of the body is called .. process. In the Assessment Book:

Try to answer: Sef-Assessment (4)



Exercises on Lesson 4

-	In decade -	
	Ingereran	ı

@ Apply

• Analyze

Evaluate

O Creat

Choose the correct answer:

- 1. The energy that the living organism needs to perform different functions is obtained from
 - a. breathing only.
 - b. food processing only.
 - c. breathing and running.
 - d. breathing and food processing.
- 2. All of the following are organs of the digestive system except
 - a. mouth.
- b. nose.
- c. stomach.
- d. esophagus.

- 3. Digestion process begins in the
 - a. stomach.
- b. esophagus.
- c. mouth.
- d. small intestine.
- 4. Which of the following organs does not share in breaking down of food?....
 - a. Mouth.
- b. Stomach.
- c. Lungs.
- d. Small intestine.

(Behira 2

- 5. Crushing the food in your mouth is the function of a. stomach.
 - d. teeth. c. saliva. b. tongue.
- 6. All of the following are correct about the mouth, except
 - a. it is the first organ in the digestive system.
 - b. it has teeth.

- c. it has to
- d. it moves directly food to the stomach.
- 7. Saliva in the mouth makes the food become soft and mushy with the help of
 - a. teeth only.

- b. 307
- c. teeth and esophagus.
- d. teeth a.
- 8. The throat is connected to the stomach through
 - a. esophagus, b. trachea.
- c. small intestine. d. large intestine.
- 9. The organ that moves the food into the stomach is
 - a. mouth.
- b. tongue,
- c. esophagus.
- d. small intestine.
- 10. The food passes from the stomach to the directly.
 - a. esophagus b. small intestine c. large intestine d. anus
- 11. The stomach mixes the food with to help in digestion of food.
 - a. digestive juices only
- b. stomach acid only
- c. saliva and digestive juices
- d. stomach acid and digestive juices

•	12.	The liver and	pour their juice	as into the small in	itaatina
		a. throat	b. esophagus		
•			a tube that its lengt	b is about more the	an six meters is called
		a. large intestin	e		
		c. esophagus.		b. small intestine.	
•			food page from #	d. stomach.	
		a. liver.	food pass from th		
	15				d. large intestine.
	10.	a. starch	estine, is abso		
	46		b. fat	c. water	d. pil
•	10.	must expel the	es of undigested fo	od become useles	ss to the body, so the body
		a. mouth.	m outside it through		
			_	b. anus.	
	47	c. large intestin		d. small intestine.	
Ĭ	17.				lered as adaptation.
		a. only structura		b. only behavioral	
	40		d behavioral		
•	18.		on, air enters throu	gh then dow	n the throat.
		a. nose and tra		b. nose and mout	h
		c. mouth and lu		d. mouth and trac	hea
•	19.	The passage of	fair during inhals	47)	
		a. throat nose	e – lungs – (re ⇒,		
		b. tracheathro	oat –lungs – no .		
		c. lungs - nose	- throat - trachea		
		d. nose – throa	t – trachea – lungs	•	
•	20.	. The throat is co	onnected to the lun	gs through	
		, ,	b. trachea.	c. small intestine.	
•	21.				ssages (bronchioles)
			ir sacs surrounded		
		a. air,	b. water.	c. small intestine.	
•	22.				bes known as
		a. alveoli.	b. air sacs.	c. bronchi.	d. blood vessels.
•	23		s moves from air in		
		a. nose.	b. throat.	c. trachea,	d. lungs.

- - a. diaphragm relaxes.
- b. diaphragm contracts.
- c. diaphragm moves upward.
- d. the size of chest decreases.

Choose from column (B) what suits it in column (A):

1.			
(A)	(B)		
Esophagus Small intestine	a. absorbs water from the undigested food to become solid wastes. b. mixes the food with an acid and digestive juices.		
Large intestine Stomach	c. digestion begins in it. d. is a long winding tube, its length is more than 6		
5. Mouth	meters. e. is a muscular tube that moves the food down into the stomach. f. solid wastes leave the body through it.		
4 2	5,		

• 2.

(A)	(B)		
1. Trachea	a. is a large muscle at the base of the ribs and helps in		
2. Blood	inhalation and exhalation		
Z. D1000	b. are like balloons and facy contain little sacs		
Diaphragm	surrounded by blood vessels.		
4. Lungs	c. carries oxygen to all the body organs.		
1. Editigo	d. is a tube through which air travels down into the lungs		
	e. air enters the body through them.		

Put () or (X):

- 1. The digestive system consists of similar organs that work together to get nutrients from food.
- 2. The human body gets oxygen gas from food.
- 3. Mouth, nose, esophagus and stomach are from the organs of the digestive system.
- 4. The food passes through the large Intestine before it goes into the small intestine. (Sohag 2022) (

•	5.	Digestion process begins in the stomach with the help of saliva.		1	١
•	6.	Tongue and teeth moisten the food, while saliva crushes the food until it becomes soft.		,	,
•	7.	Food passes from mouth to stomach through a narrow tube know small intestine.		(,
•	8.	Food usually stays in stomach for few hours until it becomes a solliquid.	na 2022) Nupy)
	9.	Stomach mixes the food with juices that come from liver and pane		()
	10	The food gets broken down into nutrients in the small Intestine.	creas.	()
•		The walls of the small intestine absorb the nutrients through tiny to vessels then blood carries them to all the body parts.	bool	()
0	12.	Swallowing food without chewing keeps the digestive system hea	lithy	7	\ \
•		Digestive system ends by anus.		7	7
•		The air travels down into the lungs through esophagus.		7	ر ۱
•		During inhalation, the size of chest becomes narrow.		(7
•		During exhalation, the disease	ag 2022)	(,
•		The inhaled air is rich in carbon dioxide gas, while the exhaled air		(,
		is rich in oxygen gas.		1	1
•	18.	Exposing to air rich in dust harms the respiratory system.		()
4	W	rite the scientific term of each of the following:			_
•		A system that helps in breaking do that the smaller parts.	(ì
•		A group of organs that work together to purform a specific job.	(-
•		A process of breaking down food into smaller parts that the body cells absorb and use to get energy and growth.			
•	4.	. The organ, where the digestion process begins.	(•
•		They present in the mouth and play an important role in crushing of food.	(
•	6	. A liquid substance in your mouth that moistens the bite of food and begins to break it down.			
•	7	. The organ which receives the food from esophagus,	(•
•		. An organ that has tiny blood vessels to absorb the nutrients throug	1		,
		its walls.	(********)
	9	. An organ through which solid wastes of digestion leave the body.	(,	1

Understand Copper
 10. A long muscular tube that moves the food down into the stomach. (
13. A large muscle that contracts during breathing in and relaxes during (Beni Suef 2022) (breathing out.
Complete the following sentences: 1. The human body uses
grind (crush) the food well. 3. In the digestive system, food becomes a soupy liquid in the, while breaks down into nutrients in
4. Theis a tube that has muscles to move the food down into the stomach, while is a long winding tube, its length is more than six meters.
5. The longest part of the digestive system where most digestion takes place inside it is
6. The small intestine receives juices from and that help in digestion process.
 7. The walls of the small intestine absorb the digested food and transfer it into your blood stream through.
8. In the digestive system, intestine absorbs the nutrients through its wall, while intestine absorbs water from the undigested food.
 9. Air enters and exits the human body through system.
• 10. Inside the lungs, the end with little air sacs known as
 11. During inhalation, air travels down from your throat to your lungs
through
12. At the base of your ribs, there is a large muscle that plays an important role respiration process known as
13. During inhalation process, the diaphragm contracts and moves

while during exhalation process, the diaphragm expands and moves

(Menofia 201

P. 1.4.4.

tiny blood vessels.
······································
()
(
()

(A)	(B)
Organ (1)	
Organ (2)	in which the absorption of nutrients takes place
Organ (3)	it ends with anus.
Organ (4)	it connects the throat with the two lungs.

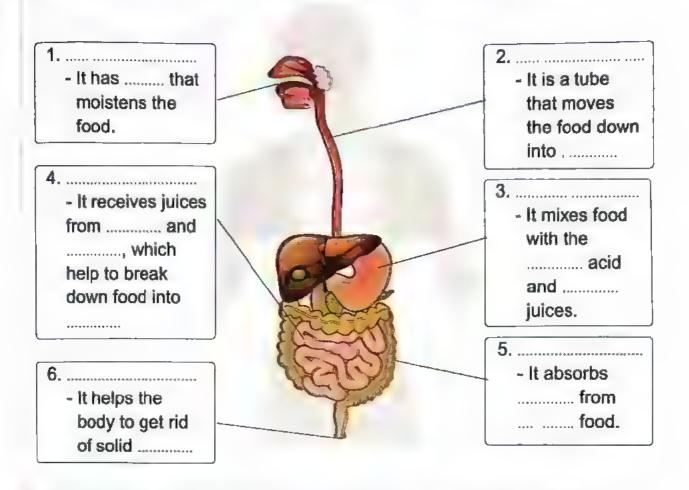
10 Compare between:

Inhalation	Exhalation

Put (🗸) in front of the name of the system to which each of the following organs belongs :

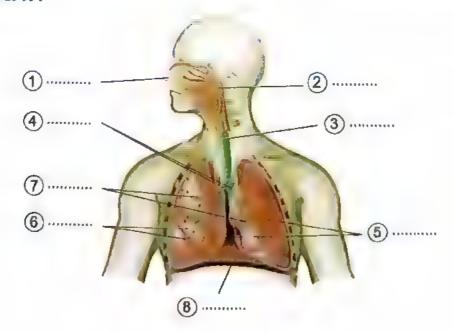
The organ	The system			
	Digestive	Respiratory		
1. Trachea				
2. Anus	/*************************************			
3. Stomach				
4. Lungs	***************************************			
5. Small intestine	7*************************************			
6. Esophagus	**************************************			
7. Diaphragm	***************************************	1.514.		
8. Nose	22271214422222447111111114441413121422213111114114114	111111111111111111111111111111111111111		
9. Large intestine	\$*F10*1(\$)****** \$10******************************	PIRAMETER AND ADDRESS OF TAXABLE		
10. Liver	TO GREEN TO DEPART THE CONTROL OF TH	***************************************		
11. Pancreas	4510044(74774744)1177714(34774741417414144444444444444444			

Look at the following figure which represents the human digestive system, then mention the name of each organ and complete the sentences below:



1B Look at the following figure which represents the human respiratory system,

then label it:



Look at the opposite figures, then answer the questions below:	
(1) Which figure represents inhalation ? ((Section 2)
(2) Which figure represents	7
(3) In figure (a). muscle	3
(4) In figure (b), the air that comes out is rich in . gas	
Equip (n)	Fedure (b)





Activity 12 How Fish Breathe

▶ Look at the following pictures, then put (√) or (x):



1 Human can stay and breathe under water all the time.



Fish can stay and breathe under water all the time.)

Structural adaptation of fish:

- Unlike human, fish don't breathe using lungs, but they have gills to breathe.

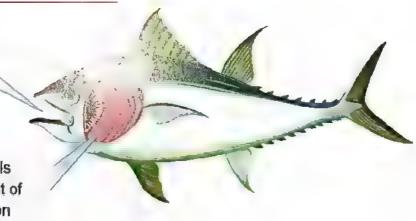
١

- Gills are considered as unique structural adaptation that allow fish to live and breathe under water.
- Gills are found on both sides of a fish's head.

How do fish breathe under water?

Water enters the mouth of the fish and passes across the gills.

Blood vessels inside the gills carry oxygen gas to the rest of the body and release carbon dioxide gas.



Note

Fish need clean water to survive, as we need to breathe clean air to stay healthy.



Check your understanding

► Compare between the human respiratory system and the fish respiratory system using these words:

(carbon dioxide - blood - oxygen - air - lungs - water - gills)

(carbor	dioxide - blood - 57,5	The fish respiratory system	
Points of comparison	The human respiratory system		
	- Inhalegas Exhalegas. carries oxygen gas to al		
Differences :	- Humans have to inhale oxygen gas from	- Fish have to inhale oxygen gas from	

Put (√) or (x):

- 1. The importance of gills to fish is like that of lungs to human.
- 2. Oxygen gas reaches all parts of the fish's body through the blood vessels present in its gills.
- 3. Carbon dioxide gas is harmful for both fish and human.
- 4. The type of adaptation in fish's gills is considered as behavioral adaptation.

similarities

differences نشابه

Activity 13 Humans Change the Environment

- Human activities cause changes or impacts in the ecosystem over time, so organisms will have to adapt these changes to survive.

Types of environmental changes

Slow changes

These changes lead to:

 Organisms will be able to adapt over time to survive.

Rapid changes

These changes lead to:

- Moving some organisms from one habitat to another, in which they can live and survive.
- Disappearance and death of some living organisms.
- Extinction of some living organisms.

▶ Environmental changes may occur as a result of :

1. Natural changes.

2. Human activities.

1. Natural changes, such as :



1 Change in temperature.



Change in the amount of rainfall during seasons.



Extreme weather conditions, such as strong winds.



Wildfires.

إنقراض



5 Floods.

impacts
disappearance
extinction

الثيرات human activities اختفاء floods

المبطة الإسبان natural changes فيضابات wildfires

تغيرات طبيعية حرائق القابات



Wildfires and floods change the nature of plants that are available for food causing increases or decorate increases or decreases in predators and prey populations.

2. Human activities, such as:



(1) Cutting down forests.



Farming and clear ng lands.



Building communities instead of grasslands.



Introducing plants and animals into the environment that were never part of the ecosystem.



Air pollution that is caused due to the exhausts from cars and some factories.



Water pollution that is caused due to bad habi such as throwing waste materials to waterways and soil.

Note

Changes resulted from human activities can cause the disappearance of plants and animals that once lived in an environment.

Give reason for ...

Although the air, water and soil get polluted as a result of human activities, plants and animals can survive.

Because:

- Some animals can survive by moving to another ecosystem to find what they need
- Plants depend on their seeds to land in a better place for them to survive and grow

 As the human activities have negative effects on animals and plants, they also have negative effects on human such as:





- 1. Water pollution makes the human hard to find clean drinking water.
- 2. Air, water and soil pollution make the crops cannot grow.
- 3. Air pollution (smog) makes the human hard to breathe.
- 4. People live in big cities must change their lifestyle to decrease air pollution.

The role of human to help restore ecosystem:

- As humans can cause harmful changes, they can help restore their ecosystems by :
 - Replanting the cleared forests.
 - Removing the pollutants of air and water.
 - Preserving plants and animals in these ecosystems.

-B	
一門	Check your understanding
-	

▶ Put (√) or (x):

 Wildfires and floods cause changes in some properties of an ecosystem. 	()
2. Water pollution affects fish, but doesn't affect humans and plants.	()
3. Humans must keep air, water and soil clean.	()

Activity 14 Record Evidence Like A Scientist

- ▶ In this concept, you have learned a lot about how different types of adaptations help plants and animals survive.
- ▶ In this activity, which will be repeated at the end of each concept, we will learn to think like scientists to answer a question about one of the main points of this concept through four main steps :
 - Step (1): The Question.
- Step 2 : My Claim.
- Step 3 : My Evidence.
- Step 4 : My Scientific Explanation

? Step 1 The Question

How do different types of animals and plants adapt to survive in extreme climate?

-0- Step 2 My Claim

Animals and plants have the ability to change their bodies structures and behaviors to adapt the extreme climate to survive in their environments.

Note

Your claim should be formed of a sentence that gives an answer for the previous question in step 1.

(1) Step 3 My Evidence

- Examples of structural adaptations :
 - Some animals have thick fur to keep their bodies warm, while some other animals have extra-long ears to keep their bodies cool.
 - Some plants have tiny leaves to hold in water.
- Examples of behavioral adaptations :
 - Some animals stay in burrows to keep their bodies warm or cool.

Note

You should mention enough and suitable evidence that support your claim.

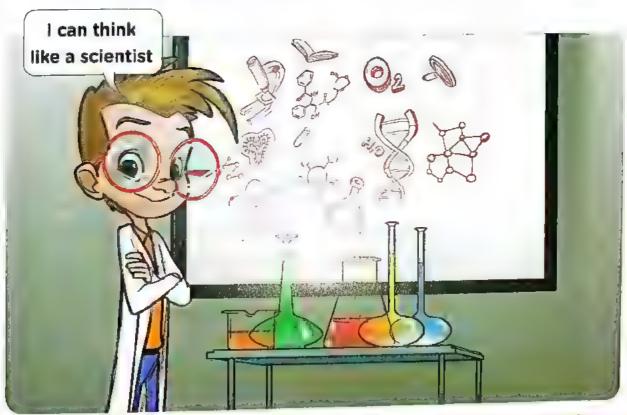
Step 4 My Scientific Explanation

Animals and plants can survive in extreme climate through structural and behavioral adaptations, where:

- The structural adaptation in the polar bears that have thick fur and penguins that have a layer of fat to adapt the cold climate in polar regions.
- The structural adaptation in fennec foxes that have extra-long ears and also the behavioral adaptation as they stay in burrows to adapt the hot climate in desert regions.
- The structural adaptation in acacia trees that have tiny leaves to hold in water to adapt hot climate in savannah regions.

Note

Your scientific explanation should explain your claim and evidence introducing some supportive examples from what you have learned.



In the Assessment Book:
Try to answer:
Self-Assessment 5

Exerc	ices	on	Les	son	5

Understand

Apply

Analyze

Evaluate

O Creat

Choose the correct answer:

1. Both of human and fish

a, can breathe in air.

c. use oxygen gas to breathe in.

b. can breathe in water.

d, use carbon dioxide gas to breathe in.

(Sohag 2

2. Fish use to breathe in water.

a. tail

b. eyes

c. lungs

d. gills

3. Gills differ from lungs, in that gills

a. take in oxygen gas.

b. expel out carbon dioxide gas.

c. extract oxygen gas from water. d. extract oxygen gas from air.

4. Gills in fish are considered as

a. behavioral adaptation.

b. structural adaptation.

c. camouflage adaptation.

d. behavioral and structural adaptations.

5. Changes that occur slowly to the environment,

a. cause many organisms to die.

b. cause many organisms to respire.

c. cause many organisms to disappear.

d. give a chance to organisms for adaptation.

 6. All of the following human activities can negatively affect the nature, except

a. cutting down forests.

b removing air poliutants.

c. farming and clearing lands.

c. throwing wastes in waterways.

7 . Human activities and bad habits can pollute . . . of an ecosystem.

a. air and soil only

b. soil and waterways only

c. air and waterways only

d. air, soil and waterways

8. Pollution of an ecosystem can affect

a, plants and animals only.

b, animals and humans only.

c. humans and plants only.

d. plants, animals and humans.

• 9. If the environment is slowly changed, plants to survive and grow.

a, must have a taproot

b. must have buttress roots

c. must decrease their adaptation

d. must land their seeds in another better place

Exelcises of

a. lung damage and down. c. heart problems and wounds. d. l 11. Human can help restoring ecosystem except a. replanting the cleared forests. b. removing air and water pollutants. c. producing more factories exhausts. d. preserving existed plants and anim	ung damage and wounds. Tany by all of the following activities, als.	207
Choose from column (B) what suits it in	(B)	
(A) 1. Changes that done by human and may harm existed birds in an ecosystem are 2. Changes that done by human and cause air pollution are 3. Changes that done by human and can restore air in an ecosystem are	 a. building more factories that produce more smog inside cities. b. rainfall, floods and severe weather events. c. replanting the cleared forests and removing of air pollutants. d. clearing lands and cutting down forests. 	er
1 2	3	
Put (v) or (x): 1. Human breathes using gills, while fish to the same found on one side of a fish's home side of a fish's home side of a fish's home side of lungs and gills take carbon diox release oxygen gas outside the body. 4. Gills are unique structural adaptation the	ead. ide gas i nside the body and	((
under water. 5. As human needs clean water to drink, f 6. Organisms have no chance to adapt, if 7. When an ecosystem is slowly changed	ish needs clean air to breathe. (the environment changes rapidly. ((
become extincted. 8. Cutting down rainforests may cause dis 9. Wildfires and floods are natural change	appearance of starred agama. (

and some factories.

6 Complete the following sentences:
1. Humans use to breathe, while fish use to breathe.
• 2. In both human and fish, carries oxygen gas to all the body parts.
3. Gills of fish are considered as adaptation that allow fish to breathe under water.
4. Among natural changes that occur to an ecosystem are,
5. Human activities and bad habits can pollute and soil of an ecosystem.
 6. All living organisms including humans, animals and plants are affected negatively by
7. One of air pollutants that makes human hard to breathe is
8. When air pollution is very high over a long period of time, it may cause and heart diseases to humans.
Give reasons for:
1. Gills are unique structural adaptation in fish.

 2. Changes that occur rapidly to the ecosystem is more dangerous for living organisms than slow changes.
////*//
3. Cars and factories exhausts cause breathing problems.
ATTACA TO A STATE OF THE PARTITION OF TH
······································
4. Sometimes people in big cities are forced to change their lifestyle.
······································

8 What happens if ?	(according to survival of living organisms
1. The ecosystem is slowly changed.	that to survival of living organisms
2. The ecosystem is rapidly changed.	(according to survival of living organisms
3. Human activities and bad habits in	
4. The exhausts from cars and factor	ies increase in big cities.

5. Water pollution increases. (for hum	nan and fish).

9 Look at the opposite figures, then answer the questions:

- The death of fish in figure (1) may happen due to
 - a. wildfires.

b. soil pollution.

c. water pollution.

- d. cutting forests.
- 2. In your opinion, the smog produced from the factories in figure (2) may cause in the ecosystem.
 - a. increasing of air pollution
 - b. decreasing of air pollution
 - c. keeping the lungs of human healthy
 - d. increasing the number of plants and animals



Figure (1)



Figure (2)













▶ Look at the following pictures, then put (√) or (x):







- 1. Humans and fish have the same organs to take in oxygen from air or water.
- 2. Humans and frogs can live on land.

Careers and adaptation:

- · Through researches, scientists can learn how different organisms adapt to their environments and help endangered species survive.
- · In this lesson, we are going to study amphibians which are one of the most amazing living organisms on Earth.

Amphibians:

They are small animals that live on land and in water such as :

Frogs





- They can live in moist (wet) environments like rainforests, water streams and ponds.
- · Like humans, adult amphibians can breathe using lungs when they are on land, but amphibians can also take in oxygen from water.

Structural adaptation of amphibians to live in wet environments:

 Amphibians breathe in (respire) through their lungs and skin to adapt to live on land and in water as follows:



Golden frog

Breathe in through lungs	Breathe in through skin
On land, amphibians inhale oxygen gas from air through their lungs.	 The bodies of amphibians are covered with skin that allows water and gases to pass through, so they can absorb (extract) oxygen directly from water.

- Amphibians need clean water and air to stay healthy, because they are very sensitive to the effects of :
 - Water pollution.
- Air pollution.
- Viruses that can travel through water.

The role of scientists to protect a supplied amphibians from extinction

- Scientists (biologists) are working to save many types of amphibians from extinction by studying :
 - How amphibians breathe in air and water.
 - Factors cause air and water pollutions that affect the life of amphibians.
 - What make these animals sick in their environments.

How do people help in protection of amphibians from extinction ?

- Clean air and water are important for amphibians, so people should :
 - Avoid throwing waste materials in water.
 - Dispose of chemicals in a correct way helps to avoid water pollution.



Ninety species of amphibians have become extinct in the last 20 years in addition to 124 other endangered species.



Check your understanding

▶ In your opinion, which of these sentences is correct and which one is incorrect to protect amphibians from pollution that may cause extinction?

The sentences	Correct (✔)	Incorrect (X)
Cutting down trees to use their wood to make furniture.	-	
Throwing chemicals into the water.		
Operating factories in proper ways to decrease the amount of smog.		
Avoid throwing waste materials into the water.		

Activity 16 Review: Adaptation and Survival

► We can summarize this concept in the following main points:

Adaptations:

They are characteristics that help living organisms to survive and reproduce the ecosystem which they live.

Camouflage:

It is a type of adaptation that some animals use to hide from their predators o their preys by blending in with the surrounding environments.

Examples of some animals that make adaptation to survive in their environments through camouflage:

- 1. Polar bear:
 - It lives in arctic region.

- It has white and thick fur.
- 2. Brown bear and black bear:
 - They live in forests.

- They have dark fur.

- 3. Caracal and fennec fox :
 - They live in desert.

They have sandy-colored fur.

- 4. Some desert lizards:
 - They live in desert.

- They have colorful scales.

Types of adaptations:

1. Structural adaptation:

It is a change in the structure of a living organism to survive.

Example: The blood vessels in the penguin's feet

2. Behavioral adaptation:

It is a change in the behaviors or acts of a living organism to survive.

Example: Desert lizard looks for shade during hot sunny days.

Plants can make adaptation to survive in their environments such as:

- · Acacia tree in Southern African Savannah, It has a very long taproot that grows directly downward to search for water below the soil surface, a very long trunk ar tiny leaves.
- · Kapok tree in Amazon rainforest of Brazil has buttress roots that are not planted deeply in the ground, but they grow high up on its trunk to hold the tree firmely in the soggy soil and hand-shaped leaves with narrow parts.

▶ Some animals and their structural and behavioral adaptations :

Animal	Structural adaptation	Behavioral adaptation
• Fennec fox : (lives in hot dry desert).	It has a tan-colored coat.It has extra-large ears.	 It pants like dogs. It lives in burrows. It eats all kinds of food.
Arctic fox: (lives in tundra desert).	 It has a thick fur coat. Its fur coat is white during winter but turns brown in summer. It has short ears and legs. 	It lives in burrows It eats all kinds of food.
Bull shark: (lives in fresh water and salt water).	It uses countershading feature, in which the upper surface of its body is darker than its lower surface.	 It eats different types of food. It hunts during the day and at night.
Panther chameleon : (lives in tropical rainforest).	 Its eyes can face opposite directions and move independently. It has brightly colored scales. It has V-shaped feet and tail like a hand. 	 It puffs up its body with air. It opens its mouth wide. It changes the colors of its scales.

System:

It is a group of organs that work together to perform a specific job.

The digestive system breaks down food into smaller parts that your body can use.

Digestion process:

It is a process of breaking down food into smaller parts that the body cells absorb and use them to get energy and growth.

Digestive system of human consists of :

1. Mouth.

2. Throat (pharynx).

3. Esophagus.

4. Stomach.

5. Small intestine.

6. Large intestine.

• Respiratory system is the system responsible for breathing.

Respiration process:

It is a process of pulling air in (inhalation) and pushing air out (exhalation) of body.

Respiratory system of human consists of :

1. Nose.

2. Throat (pharynx).

3. Trachea.

4. Two bronchi.

5. Two lungs.

6. Diaphragm.

Respiration process includes:

1. Inhalation.

2. Exhalation.

- Living organisms breathe in oxygen gas and breathe out carbon dioxide gas.
- Humans have lungs to inhale oxygen gas from air to adapt to live on land.
- Fish have gills to inhale oxygen gas from water to adapt to live under water.
- Amphibians respire through lungs and skin to adapt to live on land and in water.
- We have to keep air, water and soil clear, in order to protect living organisms fron extinction.

In the Assessment Book:

Try to answer:

Self-Assessment (6)

Model Exam on Concept (1.1)

4	Choose	the	correct	answer	
---	--------	-----	---------	--------	--

- 1. Amphibians are adapted to live in that suits their adaptation.
 - a. dry environment

- b. moist environment
- c. arctic environment
- d. sandy environment
- 2. Starred agama and salamander,
 - a. both are reptiles.
 - b. both are amphibians.
 - c. the first is a reptile, while the second is a amphibian.
 - d. the first is amphibian, while the second is reptile.
- 3. If amphibians have gills and they don't have lungs and also cannot respire through skin, then
 - a. they cannot live outside water.
 - b. they can live outside water.
 - c. they cannot live under water.
 - d. they can live in desert landscapes.
- 4. Amphibians can take in oxygen gas from
 - a. water only.

b. air only.

c. food and air.

- d. water and air.
- 5. In rainforests, we can find
 - a. panther chameleon and arctic fexes
 - b. amphibians and fennec foxes.
 - c. arctic foxes and fennec foxes.
 - d. panther chameleon and amphibians.
- 6. If the number of an animal species becomes zero due to severe changes in its natural habitat, this means that this species
 - a. becomes endangered,
- b. becomes extinct.

c. will survive.

- d. going to be extinct.
- 7. Both humans and amphibians breathe in oxygen. Which of the following sentences is correct?.....
 - a. Both can breathe in oxygen gas through lungs,
 - b. Both can take in oxygen gas through skin.
 - c. Humans can breathe in oxygen gas from water and air.
 - d. Amphibians can breathe in oxygen gas through gills.

- 8. Blood vessels that carry oxygen gas in amphiblans, present in
 - a. skin and digestive system.
 - b. lungs and eyes.
 - c. digestive system and eyes.
 - d. skin and lungs.
- 9. Amphibians, lizards, trees, birds, fish and humans

Understand

- a. some of them need oxygen gas to respire.
- b. some of them need carbon dioxide gas to respire.
- c. all of them need oxygen gas to respire.
- d. all of them need carbon dioxide gas to respire.
- 10. If a pond where some frogs live is highly polluted with wastes and viruses, What you have to do to preserve these frogs?
 - a. Fill in the pond with sand.
 - b. Dry this pond from water.
 - c. Supply this pond with more oxygen gas.
 - d. Transfer these frogs to a clean water habitat.

Put (✓) or (X):

- 1. Amphibians include frogs and salamanders.
- 2. The natural habitat of amphibians is rainforest, while that of panther chameleon is desert.
- 3. The number of amphibians increases in the last few years, due to restoring of its ecosystem.
- 4. Arctic foxes and amphibians cannot found in the same habitat.
- 5. Salamanders and fish can breathe in air through lungs.
- 6. In the habitat of amphibians, we can find some types of reptiles.
- 7. Scientists try to save golden frogs from extinction.
- 8. Clean water and air are very important for respiration process in amphibians.
- 9. It is important to advice people not to throw waste materials in waterways to save amphiblans' life.

Write the scientific term of each of the following:	
1. Species that include frogs, toads and salamanders.	
• 2. The organ through which salamanders.	()
 2. The organ through which salamanders can take in oxygen of the form water. 	gas directly
 3. A gas presents in water and air that living organisms breath respiration. 	() e in during
 4. The type of adaptation that allows frog to take in oxygen gas water directly through the skin. 	s from
• 5. A respiratory organ that contains that	(
 5. A respiratory organ that contains little sacs, and found in hull and cows but not in fish, 	mans, frogs
	(**************************************
4 Complete the following sentences:	
• 1. Starred agama lizard is a, while frog is an	
2. Humans, amphibians and reptiles have to breathe from air.	in oxygen gas
3. Bull shark can respire through only, while salaman through and 4. Both humans and adult amphibians have a second control of the salaman and	
 4. Both humans and adult amphibians have no that is respiration. 	present in fish for
5. As the pollution rate of water in ponds and air increases, the amphibians	number of
 6. Amphibians have two ways to breathe in oxygen, one from a and the other from water through 	ir through
 7. The ability of amphibians to take in oxygen gas from water the considered as	rough the skin, is
 8. All living organisms breathe in oxygen gas and gives out product. 	as a waste
9. Pollution of and may cause a big problem amphibians survival.	on the
Correct the underlined words:	
1. Fish can breathe only in air.	
2. Amphibians live in dry environments.	()
3. Starred agama is a reptile, while frog is a lizard.	()
4. Amphibians have gills as well as humans for respiration.	(
as well as numbered respiration.	()

Read the following paragraph, then answer the questions:

Panda bears live in mountainous land in China, where bamboo plants grow. Panda depends on the bamboo plants in its feeding. Panda is one of the endangered animals all around the world. Cutting down bamboo plants decreases the food source of panda, and also hunting cause a great harm on panda survival.



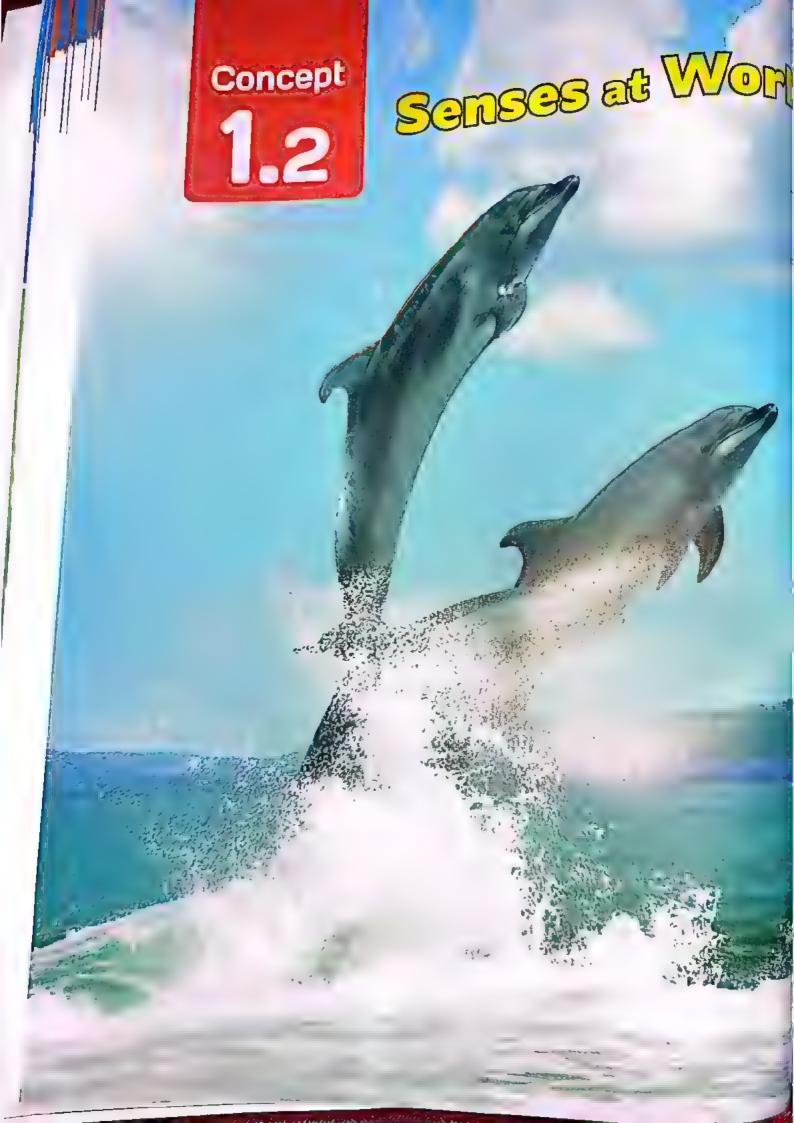
Put (V)	in	front	of	right	tstatements	and (x)	in	front	of	wrong	ones	:
-------	----	----	-------	----	-------	-------------	---------	----	-------	----	-------	------	---

1.	Due to cutting down bamboo plants and hunting, number of panda bears		
	increases.	(۱
2.	The body coat of panda is fur like other types of bears.	· ()
3.	Prevent cutting down bamboo plants and prevention of panda hunting		ŕ
	can save panda from extinction.	,	١

Model Exam on Concept (1.	1)
---------------------------	----

(3
b. can breathe in oxygen gas in water. d. are living organisms. fox changes according to b. a type of structural adaptation. d. a type of behavioral adaptation. to get water from the sandy soil. b. long roots d. long leaves hrough the b. trachea. d. tongue.
(5)
athe in through lungs.
lored fut of caracal helps it blend in with
ard can use one of their eyes for searchiout for danger.
ortant character for plants that live in dry

(A) Correct the underlined words:	(5 marks)
 Cutting down forests is one of the natural changes that cause severe damage to the agricultural fields. 	()
Reptiles like toads have two different ways for breathing.	()
3. Fish use gills to take in carbon dioxide gas out of the water.	()
 Mangrove tree has wide leaves to absorb a large amount of sunlight. 	()
(B) Give only one example of behavioral adaptation in bull shark.	
(A) Write the scientific term of each of the following :	(5 marks)
It covers the body of some types of bears to keep their bodies was and to blend in with snow.	ırm
 It covers the body of some types of bears to keep their bodies wa and to blend in with snow. A feature in bull shark, in which the lower surface of its body 	()
 It covers the body of some types of bears to keep their bodies wa and to blend in with snow. A feature in bull shark, in which the lower surface of its body is lighter than its upper surface. A plant lives in salt water environment and it has long roots to res 	()
 It covers the body of some types of bears to keep their bodies wa and to blend in with snow. A feature in bull shark, in which the lower surface of its body is lighter than its upper surface. A plant lives in salt water environment and it has long roots to res water waves. 	() ist
 It covers the body of some types of bears to keep their bodies wa and to blend in with snow. A feature in bull shark, in which the lower surface of its body is lighter than its upper surface. A plant lives in salt water environment and it has long roots to res 	() ist
 It covers the body of some types of bears to keep their bodies wa and to blend in with snow. A feature in bull shark, in which the lower surface of its body is lighter than its upper surface. A plant lives in salt water environment and it has long roots to res water waves. An organ through which solid wastes of digestion leave the body. (B) Cross out the odd word: 	() ist





Learning outcomes

By the end of this concept, your child will be able to:

- Develop models illustrating how animals receive, process and react to information in their environments.
- Explain how organs and systems work together to process and respond to input from the senses.
- Plan and carry out investigations to produce evidence that the senses play a role in reaction time.

Key vocabulary

- Brain
- Receptor
- Reflex
- Senses
- Sound
- Information

2 LAGINAS

Notes For Parents On Concept [1.2]

Lessons	Activities	What you should do with your child
	Activity 1	Explain to your child how humans and animals gather information from the environment by using their senses.
	Activity 2	environment by using their sentence. Discuss with your child how dolphins use the sense of "echolocation" to lot their preys and other objects under water.
1	Activity 3	Optional digital activity.
	Activity 4	Discuss with your child that animals can use more than one sense for one purpose
	Activity 5	Discuss with your child how some nocturnal animals use their super sens hunt their preys in the dark during the nighttime.
2	Activity 6	Explain to your child the structure of the nervous system and how it works
	Activity 7	Optional dig tal activ ty.
3	Activity 8	 Discuss with your child the difference between humans and animals in avoiding danger Explain to your child how the nervous system of "jerboa" helps it to avoid danger.
	Activity 9	Optional digital activity
4	Activity 10	- Let your child do an experiment to understand the meaning of "reaction ti - Discuss with your child that the brain of a process what we see faster that what we hear.
	Activity 11	Discuss with your child the different for _ ; _ independent system.
5	Activity 12	Let your child answer some questions at that the control system and its functions to check his/her understanding
	Activity 13	Optional digital activity.
6	Activity 14	Help your child to think like a scientist by answering a question about one main points of this concept then write his/her claim, evidence and the scientist explanation.
	Activity 15	Optional digital activity.
	Activity 16	Let your child review the main points in this concept.











Can you notice how the above living organisms receive information from their surrounding environments and how they are responding to them?

- Humans have ears which are the organs of hearing to listen music.
- ② Owls have extraordinary senses of hearing and sight to be able to find their preys in the dark.
- Oogs have very sharp senses of hearing and which are used in guarding.
- The Egyptian mongoose makes sounds to continuous makes with other mongooses. to move from one place to another or when seasoning for food.

▶ From the previous explanation we conclude that :

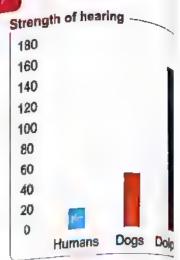
Animals have senses like humans that enable them to communicate with each other and adapt to their surrounding environments.

▶ In this concept, we will study:

- · Dolphin super senses.
- · How the five senses work.
- Super senses of some animals.
- The nervous system and how it works.

Activity 2 Dolphin Super Senses

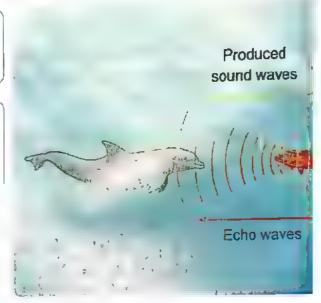
- ► Look at the opposite graph, then put (√) or (*) Living organisms in the graph have similar hearing senses to get information from their environments. (
- Dolphins have super senses that help them survive through:
 - Finding food.
 - Protecting themselves under water.
- The most sharp sense that dolphins have is the sense of hearing, since they can hear all kinds of sound.



How can dolphins locate organisms and other things under water 1

Dolphins use a sense known as "echolocation" that depends on "echo" to determine the location of other living organisms and objects in the water.

- Let's see how dolphin use the sense of echolocation:
- Sound produced by dolphin travels in the form of waves called sound waves.
- These waves travel through water and when they hit objects, they bounce back to the dolphin in the form of echo.
- Echo helps the dolphin determine the location of prey and other objects.





Check your understanding

- ▶ Put (√) or (x):
 - 1. Smell is one of the super senses of dolphins.
 - 2. Echo helps dolphins locate their preys.



Optional Digital Activity

Activity [3] " Using Our Five Senses " in the school book is an optional digital activity You can do this activity by scanning its QR code found in your school book.

super senses

RUZVÍVE Incete

echolocation الحواس الفائقة echo بتعايش BOVEW يحدد مكان

hit تجديد الموقع بالصدي sounce onto

موجات

Activity 4

What Do You Already Know About Senses at Work?

Animal perceptions :

- You have known that animals have senses like those of humans.
- Each animal can use more than one sense for more than one purpose to adapt to its habitat, as shown in the following examples :



- The purpose: Avoiding danger.
- The used senses: Hearing and sight.
- The purpose : Finding food.
- The used senses: Sight and taste.





- The purpose : Recognizing friends.
- The used strates: Smell and sight.
- The purpose: Identifying objects.
- The used senses: Touch, smell, sight, taste and hearing.





Check your understanding

▶ Put (√) or (x):

- 1. The owl can search for food using its sight sense.
- 2. The cat can avoid danger using its taste sense.

()
-	

In the Assessment Book :
Try to answer :
Self-Assessment 7

perceptions الإدراك الحسى adapt يتكيف avoid الإدراك الحسي [101]

line.li	xercise		Evaluate	
● Understand	OApply	Analyze		
1 Choose the	correct answer :	bala it do all 0	f the following, exc	ept
a. survivir	ng. water.	d. protecting	g itself under water	
a. sight, h b. sight, n c. taste, to	senses of humans a nearing, touch, sme novement, taste, to ouch, movement, he nearing, taste, smell	uch, and movement. uch, and smell. earing, and smell.		of
 3. To know in a. sight. 	f a cup of water is h b. hearing.	ot or cold, we need c. smell.	d to use the sense of d. touch.	JI .
a. taste a c. smell a	listinguish between nd hearing. nd hearing.	b. sight and d. taste and	sight.	
6 5. If there is distinguis a. smell.	th between them the b. taste.	rough the sense of	another dish, you d. hearing.	
2 Put (🗸) or ((X):	brough case whice.	e the organs of si	ahl
1. A numan2. The Egyptounds.	otian mongoose can	committee with	its species by maki	ng
• 3. The sens	e of hearing of dolp	hins is strong in the	at of human.	
• 4. We use o	our sense of smell to	identify the color.	1,627.61	
food thro	ugh the sense of to	uch.	o . → ont types of	
6. Chamele	on uses its tongue t	o taste food.		
	cientific term of eac			
	erty that depends of elr preys under wate		ing through which d	olp
[[11 2/21/23 11 12				
• 2. The orga	in used to recognize	different colors.		

4	Complete the following sentences:
	1. The dog uses the senses of and in guarding.
Ī	The dog uses the senses of and
	of
	of
0	4. We can identify the odor of flowers using the sense.
	Correct the underlined words:
5	The delphin has sharp sense of touch.
Ī	
	2. The fox uses its tail and ears to run away when its enemies.
	3. The dog uses its eyes to recognize odor of humans.
6	Give reasons for :
•	1. The Egyptian mongoose make sounds.
-	2. Owls can hunt during the night.

	3. Dogs are used in guarding.

	4. Dolphins can hear all kinds of sound
7	What happens when the sound waves produced by a dolphin hit an object
	under water ?
8	Arrange the following steps to illustrate how dolphins use their sharp hearing
	to catch preys:
	() The sound waves travel and hit the prey, then bounce back to the
	dolphin in the form of an echo.
	() The echo helps the dolphin locate its prey.
	() The sound produced by a dolphin is transmitted in the form of waves
	called sound waves.

Look at the following pictures, then choose the correct answer:

Understand

OAPPLY







Animal (2)

- 1. The sharpest senses that animal (1) has are
 - a, touch and smell.

b. smell and hearing.

c. taste and sight.

- d. hearing and taste.
- 2. Animal (1) uses one or both of its sharpest senses in each of the following situations, except
 - a. identifying friends.
- b. identifying food.
- c. recognizing strangers.
- d. tasting food.
- 3. The sharpest sense that animal (2) has is
 - a. hearing.

b. taste.

c. touch.

- d. smell.
- 4. Animal (2) uses its super sense in each of the * wing situations, except
 - a. locating objects under water.
 - b. avoiding danger.
 - c. detecting scents of living organism ander water.
 - d. locating preys under water.

LESSON



Activity 5 Super Senses

▶ Look at the following pictures, then put (✓) or (x):





- Human can see everything clearly inside a dark room.
- An owl can see its prey in the dark during nighttime.
- You can hear the noise of something moving through the darkness, even you cannot see it clearly.
- Some animals can look for their food at night using their super senses, these animals that become active at night are known as " Nocturnal animals ".
- Why do some animals become active at night?
 - 1. In extremely hot places, the best time to look for food is nighttime, when it is cooler.
 - 2. Some animals hunt food that is only available at night.
 - 3. Some animals depend on darkness to hide from their preys and surprise them.
- ▶ How can nocturnal animals hunt without much available light?

Super sensory adaptations of nocturnal at the allow them to navigate safely and find food in the dark, as shown in the following examples:

1. Snakes:

Snakes have the ability to sense heat of their preys' bodies using a specialized body part in their faces.

Purpose:

To locate their preys in complete darkness through sensing their body heat.



2. Bats :

- Bats rely on echolocation like dolphins to find their food.
- The sound bounced back to bats help them to find their preys and move around.

Purpose:

To find insects at night because unlike dolphins, bats must hunt in the dark.



3. Owls :

- Owls have both extraordinary sight and hearing.
- Bowl-shaped faces and specialized head feathers pick up and amplify distant sounds then direct these sounds into the owls' ears.
- Owls' large eyes allow them to detect tiny and faraway movements of their preys that hide in the grass or under the snow.
- Owls have the ability to turn their heads in all directions to search for preys everywhere.



To detect the movements and sounds of tiny distant pre /-.



Check your understanding

Give a reason for:

Bats can catch insects in the dark.

Activity 6 Pizza and the Nervous System

- Senses work together with the nervous system to gather information from the environment.
- Mammals such as humans, elephants and dogs have the same structure of nervous system.

The nervous system consists of:

- The brain.

- The spinal cord.

- Nerves.

The brain

- The brain is connected to a big nerve that runs through the backbone called the spinal cord.
- The brain is connected directly to some nerves such as the nerves of the eyes and the heart.

Its function:

It is the main control center in the body.

The spinal cord

The spinal cord is branched into smaller and smaller nerves.

Its function:

It helps carry messages to and from the body and the brain.

Nerves are ostributed throughout the body and connect the sense organs and the body parts with the brain.

Their function:

They carry messages from the brain to the spinal cord and other parts of the body, as well as from other parts of the body to the spinal cord and the brain.

Human nervous system

nervous system gather mammals spinal cord الجهاز الغصبي

nerves بجمع فييات backbone distribule الحيل الشوكي

أعصي

العمود الفقري



1. The nerves transmit information from the sensory organs to the brain in 2. The five sensory organs contain a special type of nerves known as sensory rece

Sensory receptors:

They are nerves found in different parts of the body that are responsible for receiving information from the environment.

How does the nervous system work if you smell pizza?

- The sense organ (nose) receives the information from the environment which is the pizza's odor.
- 2. Then the sensory receptors of smell that are found in the back of your nose send specific signals along the nerves to your brain. These signals are in the form of electrical impulses.



3. Once the information about the smell reaches your brain, the brain proces that information and determines the type of the food.



Garage mariles is to

▶ Choose the correct answer

Imagine that you are touching an ice as, a with your finger. Do you know whe the information is processed to tell you that use now?.....

- a. In your finger.
- b. Hand.

Nerve.

d. Brain.

e. Spinal cord.



Optional Digital Activity

Activity 7 "Processing Sensory Information " in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

> In the Assessment Book Try to answer: Self-Assessment (8)

electrical impulses

sensory receptors تبضات کهربیهٔ

signals رائحة

Choose the correct	answer:
--------------------	---------

- 1. The senses you rely on to find a small radio that produces low sound in a dark room are
 - a. hearing and smell.

b. touch and taste.

c. smell and taste.

- d. hearing and touch.
- 2. The brain is the main control center in the body, so it can deal with at the same time.
 - a. two senses only

b. three senses only

c. four senses only

- d. all the five senses

(Gharbia 2022)

a. diumal animals.

b. nocturnal animals.

c. extinct animals.

- d. endangered animals.
- - a. the night is characterized by the cool weather.
 - b. the night is a good time for relaxation and rest.
 - c. the night is quiet, so that they can hear preys.
 - d. the night is a time when preys are available.
- 5. A snake has the ability to catch preys at night because it can

a. smell them.

b, hear their heartbeats.

c. see them clearly at night.

- d. sense the heat of their bodies.
- 6 . Both bats and mosquitoes are active during night. Which of the following statements is correct?.....
 - a. Both can swim well.

Both can run fast.

c. Bats prey on mosquitoes.

the quitoes prey on bats.

- 7. If a rat is found at equal distance from an oblight and a snake, and the rat makes a quiet move at night, which of the following statements is correct?............
 - a. The owl may reach it first, if it senses the rat's body heat.
 - b. The snake may reach it first, if it hears the rat movement,
 - c. Both of them may reach the rat at the same time because both have sharp sight.
 - d. The owl may reach it first, because owls have sharp sight and hearing.
- 8. A snake can sense the body heat of preys at night using
 - a. all of its body.

b. a special part in its tail.

c. a special part in its face.

d. a special part in its back.

2 Choose from column (B) what suits it in column (A):

• (1)

(A)	(B)
1. Bat	a. It is a flying nocturnal animal that can hear the quiet
2. Owl	b. It is a nocturnal reptile that can sense the body heat of rats.
3. Snake	d. It is a non-flying mammal. d. It is a flying nocturnal animals that sound reflected to it after
1	hitting insects.

• (2)

(A)	(B)						
1. Sensory	a. It is the main control center in the body.						
receptors	b. They are electrical impulses that reach the brain.						
2. Nerves	c. It is found in the backbone and helps transmit messages						
	between the body and the brain.						
3. Brain	d. They are found on the sensory organs and the first to sense						
4. Spinal cord	the surrounding environment.						
4. Opinal cord	e. They receive information from the sensory receptors.						
1	2						

3 Put (v/) or (x) ·

,	ruc(v) or (x).		
0	1. The sensory receptors in the eyes receive the sound produced by a radio and send it to the brain.	(1
•	2. Animals that active during the day time to a called nocturnal animals.	7	΄,
•	3. Some animals have abilities that the tot have, and these abilities are called super sensory adaptations)
•	4. The owl depends on echo to determine the location of preys within	`	1
	the grass or beneath the snow.	i	١
•	5. A bat makes sounds that hit insects and then bounce back to it, so the bat can locate them.	,	′
•	6. A snake has the ability to sense the smell of preys using a special part in its face.	,	,
•	7. The spinal cord is the main control center of the body, which helps carry messages from and to the brain.	()
0	8. The heart and eyes are connected to the brain through blood vessels that transmit information in the form of electrical impulses.	,	,
	The state of the s	1	-)

 9. The tongue is the sensory organ responsible for taste, which sends to the brain to be processed, then identifying the food type. 	s messa
 Write the scientific term of each of the following: 1. A group of different animals that look for their preys at night. 2. A reptile that can sense the body heat of its preys at night using 	(
 a special part in its face. 3. A property by which a bat can locate its prey insects through the sound reflected from them. 	(mana
 4. An animal that can turn its head backwards, and has a bowl-shape face and large eyes. 	
 5. A system that controls all the body functions, and nerves are one of its parts. (Cairo 2022)) (*************************
 6. The organ responsible for processing information transmitted to it, then send messages to the sensory organs. 7 An organ company to the sensory organs. 	(
 7. An organ composed of a group of nerves located in the backbone, and sends messages from and to the brain. 8. Organs include the eyes, nose, ears, tongue and skin, and they red 	(
 information from the surroundings and send it to the brain. 9. A type of nerves in the sensory organs that is responsible for receiving information from the environment. 	((
Complete the following sentences: 1. To determine places of preys at night, snakes rely on their ability to produced by the prey bodies, while bats for me their preys a sense known as	using
 2. Echolocation is used by some animals such as and 3. Owls can detect the places of their preys by using the state of their preys and	
 4. An owl can see everywhere by turning its in all directions, who a chameleon can see everywhere by moving its in opposite d 	ile lirection
 5. The brain is connected to a group of nerves that passes through the which is known as the 	e backb
6. Information are transmitted from the sensory organs to the brain in the sensory organs to the sensory or the sensory organs to the sensory organs to the sensory or the sens	
 7. If you see a cat, you have received this information through the sens receptors in your, then the nerves send a signal to your 	sory to identi

6	Correct the underlined words :	
1	. Tongue is the sensory organ that is responsible for smelling sour let	mon. (
2	. The spinal cord passes through the mouth.	(
	. When a bat sends a sound against a wall, it returns to it. This pheno is called camouflage.	omenon ()
4.	. The organ that is responsible for receiving, processing and respond information is the heart.	ing to ()
5.	. The sense of sight of owls is weaker than that in bats.	()
7 G	iive reasons for :	
• 1.	. Animals that live in hot regions become active at night.	
• 2	Snakes have a part in their faces that have a super ability to sense it	neat
• 3.	Owls have bowl-shaped faces.	
• 4.	Snakes can find food at night, although they cannot see well in the d	

		• ***************
8 W	/hat happens if ?	
1.	A snake is injured in its face in the part that sense the heat.	
2.	Bats lose the ability to hear by using echolocation property,	************
		,
	•••••••••••••••••••••••••••••••••••••••	* * * * * * * * * * * * *
3.	Owls cannot turn their heads in all directions,	

a. '	Ok at the opposite figure, then answer the questions below:
	What does the figure represent?
b,	Label the figure :
	①
C.	Complete:
1.	Number () is found inside the backbone of the human body.
2.	Number () represents the main control center in the human body.
	Number () spreads all around the human body parts.



Activity 8 Sensing the Environment

▶ Look at the following picture, then choose the correct answer:

When this small animal hears a snake moving nearby, it jumps quickly in less than one second. Which system in the human and animal body do you think is responsible for the movement of the small animal in this situation?



- Respiratory system.
- b. Nervous system.
- c. Digestive system.
- ▶ In this lesson, we will learn how structural adaptations (physical adaptations) and the nervous system work together to help the jerboa survive.

Jumping jerboa:

- The Egyptian jerboa is a desert rodent.
- It searches for food at night.
- ▶ Jerboa adaptations to the environment :

Jerboa has large and sensitive ears, so it can detect even a quiet snake. (Structural adaption)

- Jerboa's feet and toes have hair to help it grip the sand when it hops and jumps.
- It hops in zigzag patterns, so it can escape quickly from danger. (Behavioral adaptation)



How do all parts of a jerboa's body work together to avoid danger? When a snake makes noise as it comes near a jerboa to hunt it:

The sensory receptors in the jerboa's ears send a message through a network of nerves to its brain.

The jerboa's brain translates this message and alerts its legs to move,

The jerboa's strong hopping legs start to jump away from the danger (the snake) in zigzag paths.

- The jerboa's sharp sense of hearing and its strong legs for jumping work toger with its nervous system to help it survive.
- The whole response process of the jerboa running away from danger occurs; than one second. The time taken by a jerboa to react to danger is known as the "reaction time".

Reaction time:

It is the time taken by the body of a living organism to react to different informs from the environment (such as danger).

- How does the jerboa respond to danger compared to a human ?
 - Both human and jerboa avoid danger by relying on sensory receptors, nerve a brain to sense and communicate messages.
 - . Both human and jerboa move quickly away from danger for their safety.

Examples:



- Jerboa hops in zigzag patterns, so it can escape quickly from danger.



- Human moves quickly his hand av when it touches the spines of a cal plant.



	Based	on	your	understanding	of	the	activity	
--	-------	----	------	---------------	----	-----	----------	--

• (Clarify	the	super	senses	that	were	most	helpful	for a	jerboa	in	sensing	dange	er.
-----	---------	-----	-------	--------	------	------	------	---------	-------	--------	----	---------	-------	-----

•	Put	(1	or	(4)	
				~ ~ /	-

PHI (4) 51 (·) .		
1. When a jerboa feels unsafe, its brain sends messages to its legs		
through its nervous system to run away from danger.	()
2. The reaction time is the time taken by a jerboa to respond to danger.	()
3. Jerboa's hind legs are short to help it jump long distances.	()

Optional Digital Activity

Activity 9 "Nerves" in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

in the Assessment Book:
Try to answer:
Self-Assessment 9

Exercises on Lesson

Understand

Apply

· Analyze

1 Choose the correct answer:

- - remains standing in its place.
 - b. jumps to hunt the snake.
 - c. makes sounds to frighten the snake.
 - d. jumps quickly to run away from the snake.
- 2. The responsible system for moving your hand away from danger, such as touching a hot cup of tea, is the system. d. urinary
- c. nervous
- - a warning message to the brain.
- b. nose
- c. feet
- d. teeth

(.....

(... . · · · ·

- 4. When your hand touches the spines of a cactus plant, it is withdrawn in . .
 - a. less than one second.
- b. one minute.

c. two minutes.

d. one hour.

Put (v') or (x):

- 1. The body senses and systems work separately when animals run away from their enemies.
- 2. The Egyptian jerboa lives in forests.
- 3. The Egyptian jerboa has large ears which help in sensing the snakes.
- 4. The Egyptian jerboa can jump for long distances depending on its long tis El-Sheikh 2022) hind legs.
- 5. Hopping of the jerboa in zigzag patterns to run away from danger is considered as a structural adaptation.
- 6. The large ears of jerboa is an example of structural adaptation.
- 7. The habitat of the jerboa is similar to that of the polar bear.

3 Write the scientific term of each of the following:

- 1. A desert rodent with a small body, large ears and long hind legs.
- 2.The time taken by an organism's body to respond to different reactions. (.....
- 3. A system that works inside the body to keep the organism away from danger.
- 4. The organ which receives and processes the messages sent from the sensory receptors that are found in a jerboa's ears.

4	Complete the following sentences :				
•	 Hopping of the Egyptian jerboa in zigzag patterns is considered as adaptation. 	s a			
•	2. The presence of hair on a jerboa's feet and toes is a adaptation.				
P	3. The Egyptian jerboa and the fennec fox have an excellent sense of where both of them have large	of,			
•	 The Egyptian jerboa has long to help it jump for long dista has hair on its feet and toes to help it 	ances, and it			
•	5. When hearing an alarm ring, the sensory receptors that are found send a message through a network of nerves to the which what to do to avoid danger.	in the h determines			
•	6. When the Egyptian jerboa is in danger, it starts to run away, this acting a very short time called the	ction occurs			
5	Correct the underlined words:	•			
	 When your hand touches the spines of cactus plant, you move it away slowly. 	()			
	2. A jerboa's feet and toes are covered with feathers.	()			
	 The digestive system delivers messages through a network of nerves around all body parts. 	()			
	4. The long hind legs of jerboa are considered as behavioral adaptati	ion.			
	(Damitta 2022	2) ()			
6	Give reasons for :				
•	1. The Egyptian jerboa can jump for long distances.				
•	2. The presence of hair on the Egyptian jerboa's feet and toes.				
•	3. The Egyptian jerboa's ears play a very important role in its survival				
67	What have a feet 2				
•	What happens if? 1. Your hand touches the spines of a barbary fig plant.				
	2. The Egyptian jerboa hears a snake moves towards it.) 744			



Activity 10 Reaction Time

▶ Look at the following picture, then put (√) or (×):

Both eyes and ears receive information from the environment, then send them to the brain to process these information.

In this experiment, we will find the reaction time for catching a meterstick that is dropped.



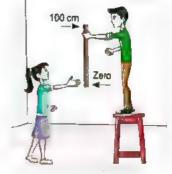
Tools

Meterstick (100 cm) - Chair.

Steps

In the first part of this experiment, we will use the sense of sight to see when the meterstick is dropped.

- 1. A boy stands on the chair holding the top of the meterstick (at 100 cm), while a girl approaches her hand near the end of the stick (at zero) without touching it.
- 2. The boy drops the stick and the girl will try to catch it as fast as she can.
- 3. Record the distance that the stick fell before the girl catches it.
- Repeat the previous steps three times, then record the results in the Reaction Time Data Table, circle the middle number of distance and record this number in the Median Distance column.







It is important to do multiple trials to improve accuracy.

In the second part of this experiment, we will use the sense of hearing to listen for a signal to know the meterstick is dropped.

- 5. Repeat the step ①, while covering the eyes of the girl.
- 6. Ask the boy to say the word "go" when he releases the stick.
- 7. Repeat the steps ②, ③ and ④.
- 8. Use the following Meters/Second Conversion Chart to convert the median distance to reaction time, then record the time in the final column of the Reaction Time Data Table.



Meters/Second Conversion Chart

Weters/Occord							١					
	Distance	5	10	15	20	25.5	28	43	61	79	99	
	(cm)								75	40	45	l
	Time (sec.)	10	14	17	20	23	25	30	35	40	73	ı

Observation

Reaction Time Data Table

Experiment	Trial ①	Trial ②	Trial ③	Median Distance	Reaction 7
1. Relying on the sense of sight:	 			15 cm	17 sec
2. Relying on the sense of hearing:	79 cm	61 cm	43 cm	61 cm	35 sec

Conclusions:

- In the two parts of the previous experiment:
- When the eyes saw the meterstick drop, or when the ears heard the voice "ç they sent signals to the brain through nerves. The brain processed the inform and sent messages to the muscles in the hand to catch the stick.
- You could catch the meterstick faster when you saw it drop, because the bra process what you see faster than what you hear.



Check your understanding

- ▶ Put (✓) in front of the situations that illustrate en importance of reaction time:
 - 1. Seeing the red traffic light and pressing the brakes on a car.
 - 2. Hearing a fire alarm and running away from this place.
 - 3. Falling while playing football.
- 4. Holding a hot object and dropping it.

8	in the Assessment Box
ì	Try to answer:
	Self-Assessment (10)

Evaluate

Choose the correct answer:

- 1. Reaction time can be estimated from the time between
 - a. suitable response, and sending message to the brain by the sensory receptors.
 - b. sending message to the brain by the sensory receptors, and suitable response.
 - c. suitable response, and suitable next response.
 - d. sending two messages to the brain by the sensory receptors.
- 2. The shorter the reaction time of a prey, the......

Apply

- a. faster the prey can run away from the predator.
- b. faster the predator can catch the prey.
- c. longer the time taken by the prey to detect the presence of a predator.
- d. less chance the prey survives.
- 3. The reaction time is always
 - a. less than one second.
 - b. about four minutes.
 - about three minutes.
 - d. about two minutes.
- 4. Sensory receptors, brain and nerves,
 - a. work separately from each other.
 - b. work together with each other.
 - c. only the brain works individually.
 - d. only sensory receptors work individually.
- 5. When you see a car coming towards you, to get away from it.
 - a. sensory receptors in the ears send a signal to the brain first
 - b. sensory receptors in the eyes send a signal to the brain first
 - c. sensory receptors in the eyes send a signal to sensory receptors in the ears
 - d. sensory receptors in the ears send a signal to sensory receptors in the eyes
- 6. When you hear a fire alarm and smell a smoke odor, all of the following help to escape the fire, except (Aswan 2022)
 - a. sensory receptors in the nose and eyes.
 - b. nerves, spinal cord and brain.
 - c. digestive system.
 - d. different body muscles.

Choose from column (B) what suits it in column (A):

Undersland

(A)	(B)
1. Reaction time	a. are responsible for moving a person to another place faraway from danger by the help of the nervous system.
2. Response	b. are responsible for getting energy from food a oxygen to run away from danger.
3. Nervous system	c. is the period from sensing danger to being award from it.
4. Body muscles	d. contains the main control center of the body.
	e. happens when the nervous system works with different body muscles.

B Put (✓) or (X):

- 1. The brain responds to information sent by the sense of hearing faster than the sense of sight.
- 2. Reaction time should be as long as possible so an animal can think how to run away from a danger.
- 3. Different body muscles play an important role in completing the response to danger and running away from it.
- 4. If the nervous system works well, but the animal does not have enough energy to escape, it can be hunted by the predator.

4 Correct the underlined words:

- 1. When you hear the fire alarm, your ears send a signal to the stomach. (....
 - 2. In response to a danger, blood vessels play an important role in transmitting signals to and from the brain.
 - 3. The response to a danger begins with the brain and ends with the sultable response.

Complete the following sentences:

- 1. When you see a pencil falling, the speed at which you hold it is than when you just hear it falling.
- 2. is considered the linkage between the eye, brain and hand when sending Information to hold a stick as It falls.

3. If you hurt your hand while cutting vegetables, the nerve a signal to the, therefore you feel the pain.	es in the send
4. When you taste a juice, the nerves in the send a which determines that it is sour.	a signal to the brain
5. The response of the eye nerves is than that of the	he ear nerves.
Give reasons for :	
1. Stopping suddenly when you hear the horn of a car con	
2. Runners start to run at the sound of a referee whistle.	

Reaction time is important for all living organisms to avoid What do you think might happen in the following cases it takes a longer unsuitable time?	oid any danger or harm. f the reaction time
1. A snake sensing the body heat of its prey.	
2. A jerboa hearing a snake nearby.	
3. Seeing a glass cup falling from a shelf.	
4. A bat sensing the sound waves returning back from a w	all in front of it.
Arrange the following sentences which explain how the information:	brain processes
() The brain processes information.	
() The nerves of the ears send a signal to the brain	
() The brain sends a signal to the muscles to move () Hearing the whistle sound to start the race,	to start the race.
Ramy stopped suddenly, while walking down the street be	popular ha handati
horn of a car coming fast towards him from behind. Also while crossing the street because she saw the same car of	taha suddenly stopped,
Which one has a faster reaction time? And why?	



Activity 11 How the Nervous System Works

Choose the correct answer from those between brackets:

(blood vessels-

2. The nervous system is connected by that transmit mess around the body.

(muscles - ne

Functions of the nervous system:

- 1. It gathers information through the sensory organs like the eyes, ears and sk
- 2. It makes sense of (translates) these information through the brain.
- 3. It tells the body what to do according to these information.

Example:

When the ears pick up sound waves coming from a chirping bird.

The nerves in the ears send a message to the brain, which translates these sound waves.

Then, the brain sends a message to the body about what to do, such as turn to look for the bird on a tree.



♥ Notes

- 1. Some messages, called "reflexes", are so fast that you cannot realize it such as moving your hand away when touching a very hot cup of tea.
- 2. Other messages are sent from and to the brain automatically, like the signal to brea



Check your understanding

▶ Complete the following sentences:

- 2. Collecting information about what happens inside and outside the body is on of the functions of the system.

Activity 12 Describing the Nervous System

- ▶ From the previous activity, we conclude that :
 - The parts of the nervous system work together to:
 - Sense the environment.
 - Interpret the information to decide the best action.
 - Send a signal to the body to react.
 - Without all of the parts of the nervous system, the person might not receive, send or react to the information.



Check your understanding

▶ Read the sentences that describe the nervous system, then write the correct term from the word bank in each blank:

brain – nervous system – reflexes – nerves – spinal cord – sensory receptors.

1.	The is like the command center for your body.
2.	send(s) messages to the brain.
3.	The brain is a part of the
4.	are messages sent by the nervous system that are often so fast
	that you do not think about them.
5.	The big nerve that passes through the backbone is called the
6.	The are the nerves that lie in different places of the body and are
	responsible for receiving information from the environment.



Optional Digital Activity

Activity 13 "Your Nervous System" in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

In the Assessment Book:

Try to answer:

- Self-Assessment (11)
- · Model Exam on Concepts (1.1) & (1.2)

	on Lesson	
Evarcises		a salas
	a Tuniusta	

	Un			
		ne	684	an

@ Apply

Analyze

Evaluate

1. Your sensation of hot weather depends on sensory receptors in the Choose the correct answer:

2. Recognizing thunder and lightning depends on the senses of

a. hearing and sight.

d. hearing and taste.

3. Closing your eyes quickly when strong light rays fall on them suddenly

represents

b. reflex.

a. inhalation.

d. camouflage.

 4. You opened the door of your house when you heard the doorbell. Which of following statements explains the sequence of messages inside your body this situation?.....

a. Ears —— brain —— hand.

b. Ears ---- hand ---- brain.

c. Brain ---- ears ----- hand.

d. Brain ---- hand ----- ears.

 5. You pass the football to a player in your team. Which of the following statements explains the sequence of messages inside your body in this situation?.....

a. Feet — nerves — brain.

b. Nerves —— brain —— feet.

c. Nerves —— feet —— brain.

d. Brain ---- nerves ---- feet.

6. If you smell smoke from something burning nearby, then you realized you! to move away fast. This means that there is an integration between the (Alex: dria this situation.

a. digestive system and respiratory system

b. digestive system and nervous system

c. respiratory system and nervous system

d. nervous system and urinary system

Put (v') or (X):

• 1. The brain sends automatic signals so that we can breathe.

 2. Your fingers send signals to the brain to distinguish between smooth and rough objects.

 3. Parts of the nervous system work together to gather and process information then send signals.

4. Sensory organs are responsible for processing information.

3	Write the scientific term of each of the following:	
•	1. It delivers messages between the spinal cord and different body	organs.
		(
•	2. A sense by which you can recognize the sour taste of lemon.3. They are messages sent by the nervous system that are often s do not think about them.	() o fast that you ()
4	Complete the following sentences :	
•	1. The is the organ that sends information to the brain who a perfume.	en you smell
•	2. If you come near your dog, its nose sends a message through the address and alerting it that you are coming.	he nerves to its
•	3. When you touch a very hot object, your hand moves away quick known as	kly, this action is (Giza 2022)
•	4. When you hear a train horn, in the ears send a messag a network of nerves to reach the	e through
•	5. The is the organ that is responsible for gathering surrou while the is the organ that is responsible for gathering d	inding sounds, lifferent odors.
0	6. When an owl hears the sound of a prey, sensory receptors in the information through nerves to the to be processed.	
5	Correct the underlined words	
•	1. The muscles in the sensory organization to body are respon	sible for
	receiving information from the surror carry anymonment.	()
	2. When your eyes are closed, you can distinguish between your b	prother's
	voice and your friend's voice, depending on your sense of sight.	()
	3. The spinal cord is responsible for processing sound waves com	ing
	through ears.	()
6	Cross out the odd word :	
	1. Smell – Taste – Eyes – Hearing.	()
	2. Eyes - Nose - Skin - Taste.	()
	3. Spinal cord - Lungs - Nerves - Brain.	()
7	Give reasons for :	
•	1. Humans can recognize the sounds of different musical instrume	nts.
•	2. The brain has an important function in the nervous system.	

●Create

Understand

- 1. The spinal cord became absent from the components of the nervous syst
- 2. Sensory receptors related to the eyes stopped sending messages to the
- Look at the following figures, then complete the following sentences:



Part (1)

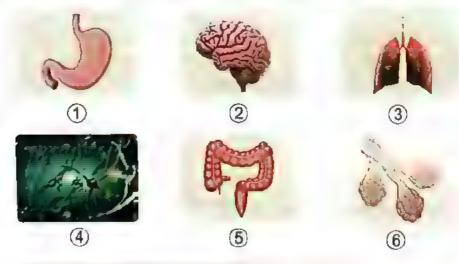


Part (2)



Part (3)

- 1. These body parts belong to the system.
- 2. When you touch a freezing bottle of water, part number in your han-tells you that this bottle is very cold.
- 10 You have some pictures of different parts of the hum: Mrite down organ number in front of the system to which it believes re following t



System	Organ
1. Digestive system :	2111135411111111111111111111111111111111
2. Respiratory system :	122-041210001104100444111111111111111111
3. Nervous system :	24(11)(11)(11)(11)(1)(11)(11)(11)(11)(11)



Activity 14

Record Evidence Like A Scientist

- ▶ In this concept, you have learned a lot about how the nervous system and the senses work together.
- Now, you are going to learn how to think like a scientist to answer a question about one of the main points of this concept through the four steps you have learned in the previous concept.
- ▶ Complete the following steps using these words below :

brain – information – nervous – skin – echo – adapt – sensory organs – ears – electrical impulses – nerves – nose.

_	
? 5	ep 1 The Question
Ho	w do animals receive and respond to different information in their environment
(C)	

Animals use their	systems	to receive	and	process	informati	ion.

Step 3 My Evidence	
The must transmit the information from the to the	he
to be processed and perceived, since our senses cannot n	rocess
information without the nervous system.	

Step 4 My Scientific Explanation

My Claim

- When animals receive information from their environment, it is transmitted to the nerves in the form of
- A signal is sent to the brain, which then sends signals to other parts of the body to respond.
- Dolphins and bats get food by identifying the prey location using the
- The sensory organs help animals and survive in their habitats, since if they do not have these organs, they cannot survive.



Optional Digital Activity

Activity 15 "Careers: Become a Neuroscientist" in the school book is an optional digital activity. You can do this activity by scanning its QR code in your school book.

Activity 16 Review Senses at Work

We can summarize this concept in the following main points:

- Some animals have sharp senses to help them adapt to their habitats and su
- The sharpest sense in dolphins is hearing, so that a dolphin can locate its p by using echolocation (echo).
- Some animals can look for their food at night using their super senses, these animals that become active at night are known as "Nocturnal animals".

Super sensory adaptations of nocturnal animals:

- Snakes: Have the ability to sense heat of their preys' bodies using a specialized body part in their faces.
- Bats: Rely on ecolocation to find their food and move around.
- Owls: Have both extraordinary sight and hearing.
 - Bowl-shaped faces and specialized head feathers pick up and an distant sounds then direct these sounds into the owls' ears.
 - Owls' large eyes allow them to detect tiny and faraway movementheir preys that hide in the grass or under the snow.
 - Owls have the ability to turn their heads in all directions to search preys everywhere.

The nervous system consists of :

TOUGS DATE

- The brain: is the main control center in the body
- The spinal cord : helps carry messages to and from the body and the brain
- Nerves: carry messages from the brain to the spinal cord and other parts
 of the body, as well as from other parts of the body to the spinal co
 and the brain.
 - The nerves transmit information from the sensory organs to the brain in the of electrical impulses.
 - The five sensory organs contain a special type of nerves known as sensor receptors.

The Egyptian jerboa is a desert rodent that has :

- large and sensitive ears.
- long hind legs.
- hair on its feet and toes.

Reaction time:

It is the time taken by the body of a living organism to react to different information from the environment (such as danger).

 You could catch objects faster when you saw it drop, because the brain can process what you see faster than what you hear.

Functions of the nervous system:

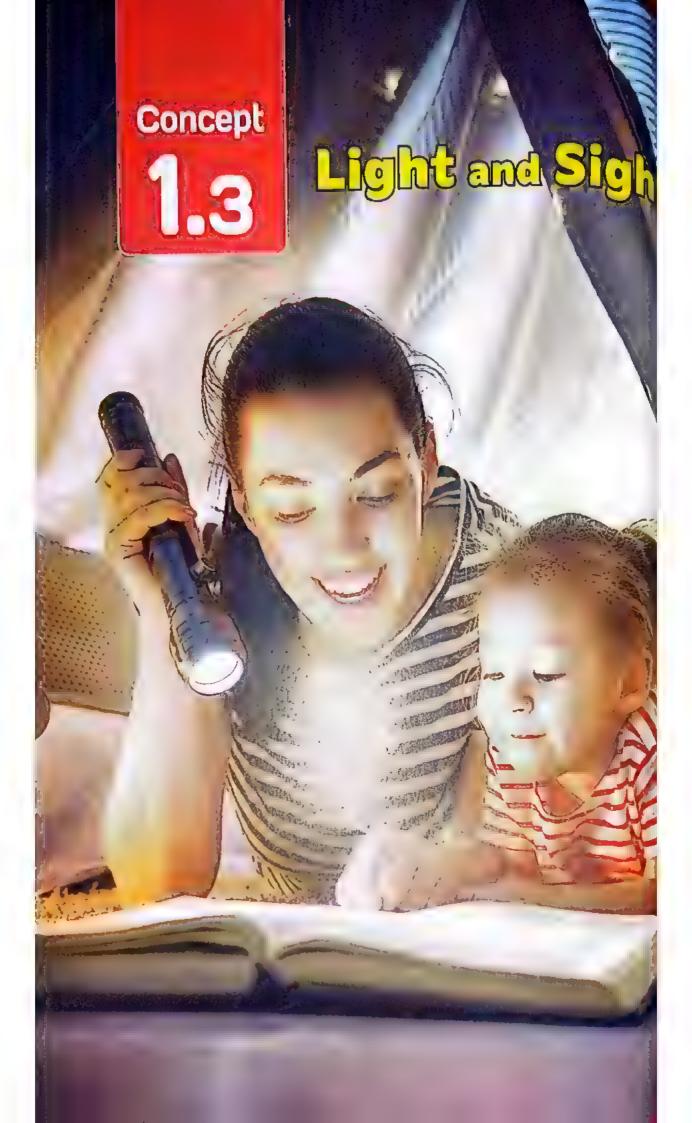
- 1. It gathers information through the sensory organs like the eyes, ears and skin.
- 2. It makes sense of (translates) these information through the brain.
- 3. It tells the body what to do according to these information.
- Some messages called "reflexes", are so fast that you cannot realize it such as moving your hand away when touching a very hot cup of tea.
- Other messages are sent from and to the brain automatically, like the signal to breathe.

Model Exam on Concept (1.2)

	 (A) Choose the correct answer: Senses that can distinguish between rate at taste and sight. sight and hearing. Bats can fly without hitting walls because a hear the echo reflected from them. touch them. see them clearly at night. smell them. When your hand touches the spines of a one minute. more than one hour. Brain, nerves and sensory receptors are a only sensory receptors work individually. only the brain works individually. they work together with each other. they work separately from each other. (B) Give a reason for: The Egyptian jerboa has long hind leg 	d. taste and hearing. se they can b. two minutes. d. less than one secon parts of the nervous synally.	thdrawn in
つ	(A) Correct the underlined words :		
	1. When you hear the fire alarm, your eye	s send a signal to the b	orain.
	1. Willest you float the me alarmy year eye	<u> </u>	(
	2. The spinal cord is responsible for proce coming through ears.	essing the information	(
	3. The dog has sharp senses of smell and	taste.	(
	4. The sense of sight in bats is stronger th	an that in owls.	(
	(B) What happens if 7		•
	Owis cannot turn their heads in all direct	ctions	
	OTHIO CALIFICATION OF THE MINE AT AN ANION	•	
	***************************************	HIGHER CONTROL	*****************

	a de la compansa de	(5 marks)
3	(A) Write the secientific term of each of the following:	ifferent information
Ī	(A) Write the secientific term of each of the following o	()
	around it.	vinegar. ()
	around it. 2. A sense by which you can recognize the sour flavor of	es are one of its parts.
	A sense by which you can recognize the sout lides. A system that controls all the body functions and nerve	()
	4. The organ which receives and processes the message	es sent from the sensory
	4. The organ which receives and processes the message	(
	receptors that are found in a jerboa's ears.	Brain —
	(B) Look at the opposite figure that shows the	
	structure of the human nervous system, then	Spinal cord —
	answer the questions: 1. Which part spreads all around the human body?	Nerves -
	1. Which part spreads all around the fluther to 19	Mel Age
	2. Which part is found inside the backbone of	
	the human body?	

	3. Which part represents the main control center in	7 1
	the human body?	
4	(A) Complete the following sentences:	(5 marks)
	1. The is the organ that sends information to the br	ain when you smell
	the scent of a perfume.	
	2. The response of the eye nerves is	
	3. Hopping of the Egyptian jerboa in zigzag patterns is co adaptation.	onsidered as a
	4. Owls can detect the places of their preys by using the	super senses of
	and	
	(B) Order the following statements which explain how t	he brain processes
	information:	
	() The brain sends a signal to the muscles t	o move to start the race.
	() Hearing the whistle sound to start the rac	e,
	() The brain processes information.	
	() The nerves of the ears send a signal to the	e brain.





Learning outcomes

By the end of this concept, your child will be able to:

- Describe how light transfers energy across distances.
- Develop a model that describes how the behavior of light enables the eye to see objects.
- Explain how adaptations help some animals gather information in the dark.

Key vocabulary

- Feature
- Light
- Matter
- Opaque
- Pupil
- Reflect
- Transparent

Lessons Activities		What you should do with your child
	Activity 1	Discuss with your child how humans and animals see things in low-light
1	Activity 2	Discuss with your child the structural adaptation of the fishing cats eyes.
	Activity 3	Explain to your child the meaning of "sources of light" and mention some examples of them.
2	Activity 4	Discuss with your child the differences between the human eyes and the noci animal eyes such as "tarsier".
	Activity 5	Optional digital activity.
3	Activity 6	Optional digital activity.
3	Activity 7	Discuss with your child the structural adaptation that some animals have eyes.
4	Activity 8	Let your child do an experiment to know eght interact with different to materials.
4	Activity 9	Discuss with your child the meaning of opaque and transparent objects, an the reflected light depends on the smoothness of the reflecting surface.
5	Activity 10	Optional digital activity.
5	Activity 11	Help your child to think like a scientist by writing his/her evidence and science explanation about a certain questions on this concept.
6	Activity 12	Optional digital activity,
0	Activity 13	Let your child review the main points in this concept.



Human









In the previous concept, you have learned that animals have senses like humans.

• Humans and animals have a nervous system that sends information from the sense organs to the brain through the nerves to process information.

Do you know what is the organ '' the ofed by light in humans and animals and how they low-light places ?

- The eye is the organ of sight that it i em humans and animals.
- Humans need light in low-light places to see clearly.
- Some animals can see better than humans in the dark such as fishing cat and tarsier monkey,

In this concept, we will study: —

- Some animals that can hunt in the dark.
- Light is a form of energy.
- Some special structures in the eyes of some animals.
- Reflection of light.
- How we can see different objects around us.

Activity 2 Hunting with Night Vision

▶ Look at the following pictures, then put (√) or (×):

- 1. Humans can see clearly in an area with low light. (
- 2. Presence of light is important for humans to see their surroundings.
- 3. Cats can see clearly in an area with low light.





Night vision in humans:

- Human eyes need light to see well.
- Without light humans would need a device known as "night vision goggles" to see in the dark.



Night vision got

Night vision in animals:

The structure of eyes of some animals help them see in the dark such as the fishi

The fishing cat

- It is a wild cat that hunts for food at night.
- The fishing cats eyes seem to glow in the dark because:
 - It has a mirror-like membrane on the back of its eyes.
 - · When the light enters the fishing cat's eyes, it bounces off this membrane, allowing the eyes to collect more light.
- The structural adaptation of cats eyes that is found in all cats allow them to have excellent night vision to hunt in the dark.





Check your understanding

▶ Put (√) or (x):

- 1. The type of adaptation in the fishing cats eyes is a behavioral adaptation.
- 2. All cats have mirror-like membrane in their eyes.

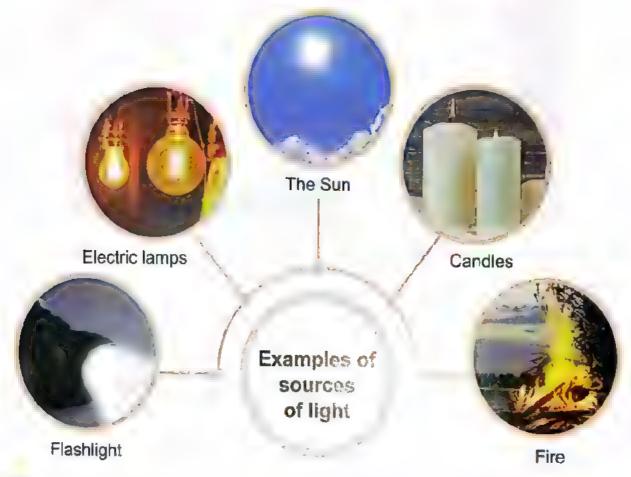
Activity [3]

What Do You Already Know About Light and Sight ?

Sources of light:

A source of light:

It is something that gives off (emits) its own light.



♥ Note

There are other objects that don't emit their own light, but they reflect the light falling on them, so they are not considered as sources of light such as:



The Moon



Mirror

How we see:

When the source of light emits light rays that fall on objects, the light rays bound these objects to our eyes to see them, as shown in the picture below.



From the previous explanation we conclude that :

Light:

It is a visible form of energy that travels in the form of way



In complete darkness, we can't see anything because without light bouncing the objects into our eyes, everything will look black.

Check your understanding

▶ Complete :

There are many sources of light such asand

▶ Put (√) or (×):

- 1. The light falling on objects bounces back to reach the eye so that we can see these objects.
- 2. The Moon is considered a source of light, so it appears bright at night. (

in the Assessment Book Try to answer: Self Assessment (12)

Exercises on Lesson 1

◆ Understand	O Apply	Analyza	● Evaluate	• Create			
Choose the	11 Choose the correct province						
11 Choose the correct answer:							
1. Which of the following organs are working together for seeing different objects? (Kafr El-Sheikh 20)							
a Nose and broin			r El-Sheikh 2022)				
c. Ears and	1		s and brain.				
		d. Ton	gue and brain.				
a, the Sun.	wing things are cons			******			
	·	b. fire.					
c. eyes.	00000000 H.J	d. the	light lamp.	(Cairo 2022)			
around him	someone walking aro n, so this person may	und in a dark pl	ace without hitting	anything			
a, have a l	ot of food energy.	• ••• •••					
	oig ability to breathe.						
	e same hearing ability	of hat					
	tht vision goggles.	or pat.					
	at have strong vision	to bunk at at-life	to all 1				
a. owl and	snake						
c. owl and			and bat.				
			and snake.				
that its abi	ural adaptation that he	alps the asping i	cat to catch a prey	at night, is			
	ne heat of prey's body	<i>t</i> .	The side the fores	st			
	t its prey easily.		and ent night visio				
	that makes the eyes	of fishing cats o	low at night is	·11.			
a. the light	that bounces off the :	surroundings,	or actingity to				
	that bounces off the		ne back of their evi	85			
c. the mair	controlling centre of	its body.	of the of	.			
	avioral adaptation with	-	qs.				
	nd the Moon appear t						
_	s off both of them.						
b. is emitte	ed from both of them.						
c. bounces	s off the Sun and is en	nitted from the N	doon.				
d. bounces	s off the Moon and is	emitted from the	Sun.				
 8. The energ 	y which must present	to make our eye	es able to see the	objects			
	is energy.			(Cairo 2022)			
a. sound		b. elec					
c light		A 200 00 00	rnotio				

2 Put (🗸) or (X) :

1. Eyes are considered as sensory organs of light, not as a source of light.

e Apply

- Sight is one of the five senses at which humans and animals depend on to see the surroundings.
- 3. Cats have excellent night vision, while snakes and bats are not.
- 4. The special membrane on the back of cats eyes is similar to the Moon, in that light bounces off both of them the falling.
- 5. The membrane that presents on the back of a fishing cats eye does not p
 in other cat species.
- 6. The Moon is not considered as a light source.
- 7. The light that enters the human eyes allows him to distinguish between wand strong sounds.

3	Complete	the following	sentences	using t	he words	below	
---	----------	---------------	-----------	---------	----------	-------	--

(source of light – mirror-like – light – bounce)

- 1. Human eyes need to see well.
- 2. All cats have a membrane on the back of their eyes.
- 3. Object that gives off its own light is called
- 4. We can see objects when the light rays off these objects to our eye

Write the scientific term of each of the following:

- 1. The organ that is affected by light and responsible for sight.
- 2. A species of wild cats, whose eyes glow at night.
- 3. Objects that emit their own light.
- 4. The organ that is responsible for processing information received by eyes, to know and recognize the surroundings.
- 5. A body that appears lighted in the sky at night, but it is not considered as a source of light.
- 6. A tool that the human can depend on to see in the dark.
- 7. The visible form of energy that enables us to see.

Correct the underlined words:

- 1. Humans and cats are similar in their seeing ability at night.
- 2. The energy that helps humans and animals see, is the sound energy.
- 3. The Moon is one of the light sources in the sky.

(.....

£.....

(.....

	4. The system that works with the eyes of living organisms for seein	g
	objects is the digestive system.	()
	5. Cats eyes glow at night due to the presence of a mirror-like mem	brane
	on the <u>front</u> of their eyes.	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	6. Sound is a visible form of energy that bounces off objects into our	r eyes.
		()
	Eyes send messages to the heart for processing information.	
	8. In a completely dark room, everything look red due to the absence	ce of light.
		()
6	Complete the following sentences :	
	1. The fishing cat can hunt at night depending on the sense of	, while
	snake can hunt at night depending on its ability to sense	which comes
	out from its prey's body.	
•	2. The fishing cat can hunt at night due to the bouncing off	energy, while
	bat can hunt at night due to the bouncing off waves.	
0	3. The eyes of fishing cat have a mirror-like membrane bounces off	the light, and
	this is considered as a adaptation.	(Beni-suef 2022)
•	4. Human can see objects which gives off their own light or objects v	which
	light.	
•	5. Among the objects which give out their own light are the Sun and	,
	while and are objects that bounce off light.	
0	6. The structure of fishing cats eyes is considered as a add	
	its being active at night to hunt is considered as a adapt	lation.
7	Give reasons for :	
•	1. The fishing cat eyes seem to glow in the dark.	
	***************************************	*****************************
	•••••••••••••••••••••••••••••••••••••••	144401498044BPh446040000 140
0	2. Candle is considered as a source of light.	

0	3. We can see the Moon shining at night although it is not a source of	of light.

Understand

8	What happens if?	he
	1. The mirror-like membrane in the fishing call by	
	See the control of the property of the control of t	· · · · · · · · · · · · · · · · · · ·
	**************************************	* *************************************
	2. The Moon can't reflect light.	
	***************************************	f444 117441 4r44 ₀
	** The three is the second to a second of the second contract of the	an ittraction sere 4
	3. The sensory receptors of fishing cats eyes are damaged.	
	Manager (140) to the Commission of the Commissio	
9	Cross out the odd word:	
-	1. Flashlight - The Moon - Fire.	(
	2. The Moon - Mirror - Candle.	(
10	Write the sense(s) which is/are stronger than those in human is following animals:	n each of th
	1. Fishing cat:	** *****************
	2. Owl :	***************************************

	3. Dolphin:	
	Minister II to a control equip. Substitute (total little little 1.0	***





Activity 4 Hunting in the Dark

▶ Put in front of the living organisms that you think they can easily see in the dark:





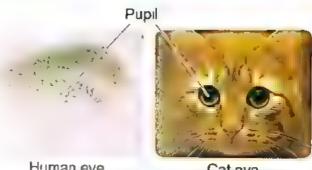


In this activity, we will learn about the difference between the eyes of humans and nocturnal animals.

The ability of humans and nocturnal animals to see in the dark:

Humans have difficulty seeing in the dark, but nocturnal animals are better able to see because:

- Nocturnal animals have bigger eyes than humans.
- The pupils of eyes of nocturnal animals usually open wider than the pupils of human eyes to allow more light enters their eyes.



Human eye

Cat eye



Nocturnal animals can see in the weakest light levels but in complete darkness, they depend on other senses such as hearing, smell and touch that help them move in the dark and avoid predators.

Give reason for ..

The pupils of cat eyes open wider than the pupils of human eyes.

To allow more light enters the cat eyes to see well in low light.

▶Now, we will study another example of these nocturnal animals called "Tarsier".

Tarsier

- It is a tiny primate (tiny monkey).
- It is a mammal that feeds on insects, small lizards or birds.
- Its body is about 10 centimeters long, not including its tail.



Tarsier

Habitat :

Southeast Asia.

The tarsier is like owl in some structural adaptations such as: Structural adaptation :

1. Eyes:

- Tarsier has huge eyes like owl, to gather and reflect any light availat to give them a picture of its surroundings.
- Tarsier can't move its big eyes in their sockets like owl.

2. Head:

- Tarsier can turn its head 180 degrees like owl, to focus on distant o near objects at night since tarsier cannot move its big eyes in their sock



Check your understanding

Complete the following sentences using the way.

relow:

(light source - eyes - mirror-like)

- 1. Tarseirs have big that help them to see everything in the dark.
- 2. Humans need to use a to see in the dark.
- 3. Cats can see in the dark due to the presence of membrane on the back of their eyes.



Optional Digital Activity

Activity 5 " Light Observation " in the school book is an optional digital activity. Yo can do this activity by scanning its QR code found in your school book.



Optional Digital Activity

Activity 6 " Light is Energy " in the school book is an optional digital activity. You of do this activity by scanning its QR code found in your school book.

> in the Assessment 60 Try to answer: Self-Assessment (13)

Exercises on Lesson 2

Understand @Apply Analyze Evaluate Create Choose the correct answer: 1. Humans have eyes than nocturnal animals. a. bigger b. smaller c. stronger d. sharper • 2. The pupils of human eyes open that of nocturnal animals. a. typical to b. narrower than c. wider than d. similar to • 3. The wide pupils of fishing cat, allows amount of light enter its eyes than those of human eyes. a. little b. large c. very small d. small 4. Nocturnal animals depend on all the following senses to find out their preys at night, except a. sight sense. b. hearing sense. c. taste sense. d. smell sense. 5. All of the following are preys for tarsier, except a. insects. b. penguins. c. small lizards. d. small birds. 6. Both tarsier and owl, a. can swim. b. can fly. c. are nocturnal animals. belong to the same species. 7. Owls and cannot move their eyes in their sockets. a. fishing cats b. arctic foxes c. humans d. tarsiers 8 . Each of human, fishing cat and tarsier, a. has an excellent night vision. b. becomes more active at night. c. has a mirror-like membrane in eyes. d. has two eyes adapted for vision. 9. Which of the following do not need a big amount of light to see in the dark? b. Humans and tarsiers. a. Humans and cats. d. Bats and humans. c. Cats and tarsiers. • 10. To detect the place of a table in a completely dark room, you can depend on b. touch sense. a. sight sense. d. hearing sense, c. taste sense.

Choose from column (B) what suits it in column (A):

(A)	(B)
1. Tarsier	a. has a mirror-like membrane on the back of its eyes.
2. Human	b. depends on the echolocation property to find a prey, c. doesn't have spectacular night vision, but depends on
3. Cat	vision acades
4. Owl	d. its eyes cannot move in their sockets, and it has a bowl-shaped face. e. its eyes cannot move in their sockets, and it is a tiny more
1	2 3 4

@ APPLY

Put (✓) or (X):

Mann 1 Cololeston 3

- 1. Nocturnal animals include fishing cats, owls, and tarsiers.
- 2. Tarsier eats insects, small lizards and small birds.
- 3. Tarsiers, fishing cats, humans and owls have an excellent night vision.
- 4. Panther chameleon eyes can move independently of each other, while tarsier and owl eyes cannot move in their sockets.
- 5. Both of tarsier and fishing cat can turn their heads 180 degrees.
- 6. Most of nocturnal animals have huge eyes to gather and reflect any little light available.

Write the scientific term of each of the following:

- 1. Animals that have spectacular night vision on which they are depend on to
- 2. A tiny monkey with big eyes and its length is about 10 centimeters long.

Correct the underlined words :

- 1. Nocturnal animals have weak night vision and also depend on excellent hea and smell senses to hunt. (. .
- 2. Nocturnal animals have smaller eyes than humans.
- 3. Toad is a tiny monkey, that has big eyes and hunt at night.
- 4. Tarsier is similar to human, where both of them cannot move their eyes in their sockets.

6		complete the following sentences:
•	1.	Eyes of human are than eyes of nocturnal animals and pupils of nocturnal animals open than that in human.
0	2.	In complete darkness, nocturnal animals depend on other senses such as
0	3.	Tarsier and owl have huge, while has a mirror-like membrane in its eyes to reflect light.
•	4.	Tarsier eyes are similar to that of as both of them can't move their eyes in their
•	5.	To see things clearly, we need a source of, but animals can hunt at night depending on other senses.
۰	6.	In the weakest light levels, dolphin can hunt depending on its sense of, while tarsier depends on its sense of
•	7.	Huge eyes in and help them to gather and reflect light, while extra-large ears in fox help it to hunt.
•	8.	The property of moving the head 180 degrees is found in
7	G	ive reasons for :
•	1.	Nocturnal animals can see better than human at night.
•	2.	Although tarsier and owl can't move their eyes, they can see surrounding objects in all directions.
•	3.	Tarsier and owl have huge eyes.
		, , , , , , , , , , , , , , , , , ,
8	W	hat happens if tarsier and owl have heads with small range of movement like uman ?





Activity 7 Special Eye Structures

- Look at the opposite figure, then put (√) or (x):
 - 1. The boy can see the different objects in the room because his eyes sense the light and his brain tells him what he is seeing.
 - 2. If light is turned off, the boy will see the different objects in the room.



In this activity, we will learn about a structural feature in the eye of son animals that allows them use very small amounts of light in a highly effective way.

Special eye structures :

Some animals such as deers, horses, cats and dogs have a feature that relates to the sense of sight, called the "tapetum lucidum".

Tapetum lucidum :

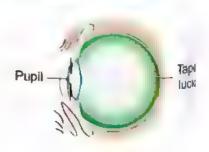
- It is a thin layer, at the back of some animals eyes that reflects light as this layer in fishing cat's eye.



Tapetum lucidum is a Latin te which means "tapestry of life

- It is a life-saving structural adaptation that helps some animals to hunt at night avoid being hunted.
- How tapetum lucidum works:
 - When light enters the eyes of such animals and falls on the tapetum lucidum layer, it bounces off it like a mirror.
 - The light that the eyes do not detect at first passes through to the tapetum lucidum and gets bounced back for second time that makes the eyes of such animals get more amount of light at nighttime.

(For illustration only)



Cats eve

etructure effective

deer

ಆನ್ರ್ tapetum luckdum

Just tapeatry of light

detect اليساط الشفاك @OW لسيج الشوء

shine طبقة



The reflection of light from tapetum lucidum causes the glow of the cats eyes when light shines on them in the dark.

Check your u	nderer	Andina
-0		-iluing

- ▶ Put (√) or (x):
 - 1. Tapetum lucidum is a structural adaptation in the human eyes. (
 - 2. Cats can see in the dark due to the presence of a special thin layer in their eyes.

In the Assessment Book :
Try to answer :
Self-Assessment 14

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-) (=	rcis					

Understand

Apply

Analyze

Evaluate

er	
	er

- 1. Fishing cat can see at night, as follows
 - a. light falls on the eyes, then reflected to the objects.
 - b. light falls on the objects, then reflected into the eyes.
 - c. sound falls on the eyes, then reflected to the objects.
 - d. sound falls on the objects, then reflected into the eyes.
- 2. All the following living organisms have tapetum lucidum, except
 - a. snakes.
- b. fishing cats.
- c. dogs.

d. horses

- 3. The function of tapetum lucidum, looks like the function of
 - a. night vision goggles.

b. white paper.

c. black paper.

- d. radio.
- 4. In the nocturnal animals, the tapetum lucidum is a life-saving adaptation because it helps them to at night.
 - a. sleep

b. breathe

keep their body warm

d. hunt a prey and avoid being h

Put (v') or (x) :

- 1. Human can see in dim light better than in bright light.
- 2. Light is a form of energy that is needed to see the surroundings.
- 3. Horses, deers, dogs and cats, all have a mirror-like membrane in their eyes.
- 4. If human has a tapetum lucidum, he can see in dim light as well as in bright light.

Write the scientific term of each of the following:

- 1. The organ of vision which receives light that has been reflected from the surrounding objects.
- 2. The life-saving structural adaptation that gives fishing cat excellent night vision.

Complete the following sentences:

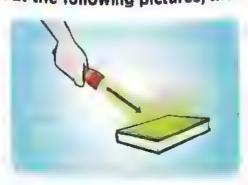
 1. Some nocturnal animals have a mirror-like membrane on the back of their! called

4	2	. Tapetum lucidum helps some animals have an excellent night vision which is
		considered as adaptation. (Giza 2022)
0	3.	Cats can hunt at night as they have a special membrane in their eyes known
	4	as, while bats can hunt at night as they use the property.
ľ	-	Tapetum lucidum light into the eyes of nocturnal animals like a mirror.
•	5.	We can see eyes of cats glow at night due to the reflection of from tapetum lucidum layer.
0	6.	If the eyes of bats have tapetum lucidum membrane, so they will have super senses of and
0	7.	Most animals can hunt when bounces off a prey into their eyes, while bats can hunt when bounces off a prey into their .
5	G	ive reasons for :
•	1.	Importance of tapetum lucidum for some nocturnal animals.
•	2.	The eyes of human do not glow like cats in the dark.
6	W	that happens if snakes have tapetum welder layer in their eyes?

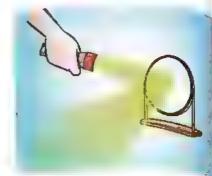




Look at the following pictures, then put (√) or (x):



Light reflects from the book.



Light reflects from the mirror.

Now, we will do an experiment that shows how light interacts with different type materials.

Tools



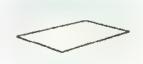
Flashlight



Piece of plastic



Piece of wood



Paper



Piece of clot



Piece of meta



Mirror



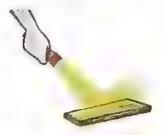
Turn on the flashlight and direct it towards each of the previous objects that a made of different materials.

• Observations

 Shiny and smooth materials (such as: mirror and metal) reflect a large amount of light.



Rough materials (such as : plastic, wood, cloth and paper)
 reflect a small amount of light.



Conclusion

Shiny and smooth materials reflect light better than rough materials.



▶ Put (√) or (x):

- Shiny objects tend to reflect light better than rough objects.
 ()
- 2. Wood reflects more light than a mirror does. ()

▶ Choose the correct answer

- 1. Which of the following objects is shirty and smooth?.....
 - a. Metallic spoon. Plastic spoon.
 - c. Wooden chair. T-shirt.
- 2. All the following materials are rough, except
 - a. cloth. b. mirror. c. wood. d. paper.

shiny ونمع smooth هوا rough المع (157

Activity 9 Light Strikes Matter

In this activity, we will study what happens to light when it hits differen of matter.

Light strikes matter

Light is a form of energy that travels in straight lines in the form of waves.

When traveling light hits an object:

- Some of the light energy is absorbed.
- Some of the light energy reflects (bounces) off the object's surface.
- Some of the light energy may go through the object.



Light reflection

So, according to the previous explanation, objects can be classified in groups which are:

Opaque ob	jects	Transparent objects
- They are objects that don't allow light to pass through.	Opaque object	- They are objects that allow light to pass through.
- Things cann't be seen	through them.	- Things can be seen through them
Examples : rocks, woo human body.	d, metals and the	Examples: air, water, glass window and lenses.

Why do you see your shadow?

Opaque objects (including your body) form shadows because all the light that hits opaque objects either bounces off or is absorbed, so no light passes through your body.



matter absorb shadow

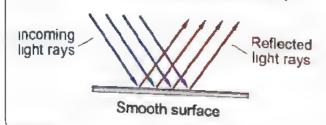
éala form opaque pariou do hit / strike

straight transparent

▶ The reflected light depends on the smoothness of the surface, where :

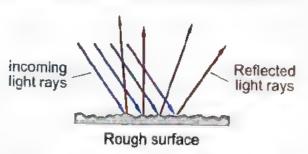
Smooth Surface

 If the surface is smooth (such as a mirror), the light rays will reflect in one direction with the same angle at which they strike (hit) the object originally.



Rough Surface

 If the surface is rough (such as a painted surface), the light rays will scatter or diffuse in different directions.



▶ How does light striking matter make it possible for humans and animals to see ?

When light rays strike an object, light reflects (bounces) off this object.

The reflected light travels in a straight line into the eyes.

Special nerves in the eyes send messages to the brain.

The brain interprets the messages as an image of this object.



Check your understanding

▶ Write the scientific term :

1. Objects that allow light to pass through.

2.	Objects	that	don't	allow	light	to	pass	through.
----	---------	------	-------	-------	-------	----	------	----------

(*****	111111	1 11491016)
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Optional Digital Activity

Activity 10 " Sight Model " in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

In the Assessment Book : Try to answer : Self-Assessment (15)

Exercises on Lesson 4

Evaluate Analyze Understand O Apply 1 Choose the correct answer: 1. Light travels in lines in the form of waves. b. zigzag a. curved d. circular c. straight 2. When light rays hit an object, all the following sentences are correct, except a. some of this rays is absorbed by the object. b. some of this rays is bounced off the object. c. some of this rays may go through the object. d. some of this rays reflects to our ears causing hearing. 3. When light hits an object, a shadow of this object is formed because light can pass through the object. b. light cannot pass through the object. c. this object is made of glass. d. this object is transparent. 4. Opaque material a. allows light to pass through. b. absorbs some of light that falls on it only. c. reflects some of light that falls on it only. d. absorbs some of light that falls on it and reflects the other 5. All of the following are transparent objects, except (Can a. glass. b. water. c. paper. 6. Opaque objects and transparent objects are characterized by . . . a. both of them reflect all incoming light. b. both of them allow all incoming light to pass through. c. both of them absorb all incoming light, d, transparent objects allow most of light to pass through, while opaque objects • 7. Mirror causes falling light rays to a, pass through it. b. reflect at the same angle they strick the mirror. c. reflect in different directions. d, diffuse like that of rough surfaces.

8. Our eyes, hoth the

a. can see both through opaque and transparent objects.

b. cannot see through both opaque and transparent objects.

c. can see through opaque objects, but not through transparent objects.

d. can see through transparent objects, but not through opaque objects.

0	9. If there are two	shoots and to the state of the		
	glass,	sheets, one is made of wood and the other is made	e of	
		the glass sheet through the wood sheet.		
	b. you cannot se	ee the wood sheet through the glass sheet.		
	c. you can see t	the wood sheet through the glass sheet.		
	d. light can pass	through both sheets.		
2	Choose from colu	mn (B) what suits it in column (A) :		
•	(A)	(B)		
	1. Mirror	a. It is a transparent piece that allows light to pass	s through	
	2. Piece of cloth	b. It is considered as a source of light that exists i	-	
	3. Reflected light	c. It is a rough surface that scatters reflected light	rays.	
	4. Lenses	d. It is the light that bounces of a reflecting surfac		
		e. It is a smooth and shiny surface that reflects me	ost of fallin	g
		light.		
	1	2		
3	Put (✓) or (X) :			
		ects include mirrors and lenses.		
		end to reflect light better than smooth objects.	(
		ece and paper reflect incoming light rays at the sar) ologe or	
	at which they str		rie arigie	,
•		ost of incoming light rays that fall on it.	,	,
		on depends on smoothness of the object's surface	,	1
_				
		c term of each of the following:		
		ow light to pass through. (Cairo 2022,) ()
Ī		cannot see through it.	()
•	3. A type of surface	that reflects light in different directions.	()
5	Correct the under	lined words :		
,		cts as a result of the absorption of light rays onto our	eves.	
			()
?	2. Opaque material	s includes water, glass, air and lenses.	(
		eflect light rays in one direction at the same angle at		
	Which they struck	k the object.	()

Undersland

6	Complete the following sentences:
1	4 Light travels in lines. (Dakate
1	2. Light and sound travel in the form of
	3. Objects that light can't pass through are called, while objects that a light to pass through are called
•	4. A tree forms a shadow as it is an object that doesn't allow to through.
•	5. Cloth and paper are considered surfaces that scatter or diffuse energy.
٠	6. Human body, wood and are considered materials which light to pass through.
•	7. Rough materials reflect light than smooth materials.
•	8. Things can be seen through objects such as and and
7	Give reasons for:
	1. Shadow of an opaque body is formed when light falls on it.
0	2. You can see an object placed behined a glass cup.
•	3. A mirror can reflect light better than a painted surface.

8	What happens if ?
•	1. You place an opaque object between a light source and a wall.
	2. Light falls on a transparent body such as a glass window.
	17 annicem et à tempeta et (perdetires e 1910) de la attain fin e e e e e e e e e e e e e e e e e e e
	a manifemente component entreprise of the address of the
	3. Light falls on a rough surface, according to the direction of the reflected ligh

the following statements to	show the correct sequence of how humans
Arrange the following statements to see different objects:	2110AA file college - 1
() Special nerves in the eye	s send messages to the brain.
() The reflected light travels	in a straight line into the eyes.
(annage as an imade.
() The brain interprets the m	
() Light rays bounce off obje	3015 around do.
Look at the following figures, then an	swer the questions below: (Giza 2022)
Figure (a)	Figure (b)
1. Complete :	
a. The surface in figure (a) is	

b. The surface in figure (b) is	
- Because	
c. In the previous two figures, the fall	ling and reflected rays show that light
travels inlines.	
2. Choose:	
The surface in figure (a) may be	10-412-14 · 1
a. plastic. b. wood.	c. mirror. d. cloth.
Classify the following materials into si	mooth materials and rough materials :
" Piece of cloth — Mirror	– Wood – Metal – Paper "
Smooth materials	Rough materials
100.4411.0	1 Delless (libites elliphine (Constitution of the Constitution of
	desired diameters and the second seco
14	, manufaction (a) position production to the contraction of the contra

12 Classify the following materials into opaque objects and transparent objects." " Wood - Air - Water - Metal - Lenses "

Wood	Transparent objects
Opaque objects	
***************************************	The state of the section of the sect
	court b totalease who yee investoured todasporroused) song,
**** ** *******************************	



Activity 111

Record Evidence Like A Scientist

- ▶ In this concept, you have learned a lot about how vision works.
 - Now, try to think like a scientist by writing your evidence and your scientific explanation for the question and claim about one of the main points of this concept through the four steps you have learned in the first concept.

	nave learned in the first concept.
(Step 1 The Question
	What needs to happen for humans or other animals to see an object in low-light areas?
	Step 2 Claim

In low-light areas, light hits an object that reflects the light to my eyes to see this object.

		.,, _,	idence			 				_
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Ste	ep 4	My Sc	lentific	Eypla	nation	_				
Ste	ep 4	My So	ientifi:		snation	 			_	
•Ste	ep 4)	My Sc			snation	 	* 1 **	**** *********		
Ste	p 4)	My So			snation	 				
*******	ep 4	My Sc			seation	 -/4 1544 .				
*****	P 4	My So			1 / /1144 -	 -/4 1544 .				

Optional Digital Activity

Activity 12 " How Do Optometrists Help us See?" In the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

In the Assessment Book :
Try to answer :
Seif-Assessment 16





We can summarize this concept in the following main points;

- * Humans need light to see clearly and without it, they will need a device kn as "night vision goggles" to see in the dark.
- The fishing cat is a wild cat that hunts during the nighttime and its eyes s to glow in the dark.
- All cats have a membrane that acts as a mirror at the back of their eyes.

A source of light:

It is something that gives off (emits) its own light.

Examples: the Sun, electric lamps, candles, flashlight and fire.

 We can see objects when the source of light emits light rays that fall on ob and bounce off these objects into the eyes, then the eyes send messages brain, where it interprets the messages as an image.

Light:

It is a visible form of energy that travels in the form of waves.

- Light travels in straight lines.
- In the absence of a light source, the human eye cannot see anything.
- Nocturnal animals are better to see in the dark than humans because they big eyes and the pupils of their eyes usually open wider than those of hum
- The Tarsier is a tiny "primate" monkey from mammals
 - Tarsier has huge eyes to gather and reflect any light available.
 - Tarsier can turn its head 180 degrees like owl to focus on distant or near objects at night.
- Tapetum lucidum is a thin layer, at the back of some animals eyes such as deers, horses, cats and dogs.
- · Tapetum lucidum is a life-saving structural adaptation that helps some anim hunt at night and avoid being hunted.
- When light falls on the tapetum lucidum, it bounces off it like a mirror.

Opaque objects:

They are objects that don't allow light to pass through.

Examples: plastic, wood and metal.

- Opaque objects (including the human body) always form shadows because all the light either bounces off or is absorbed, so no light passes through the objects.
- . Things can't be seen through opaque objects.

Transparent objects:

They are objects that allow light to pass through.

Examples: air, water, windows and lenses.

Things can be seen through transparent objects.

- The reflected light depends upon the smoothness of the surface :
 - If the surface is smooth (such as : a mirror), the rays will reflect in one direction at the same angle at which they strike the object originally.
 - If the surface is rough (such as a painted) the rays will scatter or diffuse in different directions.
- Shiny and smooth materials (such as: mirror and metal) reflect light better than rough materials (such as: plastic, wood, sloth and paper).

In the Assessment Book:

Try to answer:

- Self-Assessment (17)
- Model Exam on Concepts (1.1), (1.2) & (1.3)

Model Exam on Concept (1.3)

(A) Choose the correct answer:	night vision for hunting include b. owl and snake.
Animals that have an excellent Animals that have an excellent	b. owl and snake.
a. cat and snake. c. owl and bat.	d. owl and cat.
2. Each of tarsier, human and fish a. has a mirror-like membrane i	ing cat, In their eyes.
b. has an excellent night vision	
 c. has two eyes adapted for vis d. becomes more active at night 	
3. All of the following are opaque	objects, except
a. cloth. b. water.	c. wood. d. metal.
4. Painted surface the income	
a. absorbs only	b. reflects only
c. absorbs and reflects	d. allows to pass
(B) Give a reason for the following	ng:
You can see an object placed to	pehined a glass cup.
110-41140-4 (14(0)4)-)-401	

2 (A) Put (V) or (X):	
1. Transparent objects don't allow	v light to pass through them
Tarsier has huge eyes like owl	to gather and reflect any light available
3. Noctumal animals have bigger	eves than humana
 Human can see in dim light as a tapetum lucidum layer, 	well as in bright light if his eyes contain
(B) What happens if ?	
Light falls on a rough surface,	according to how light rays is reflected.
To Atlan Heren	g to now light rays is reflected.

(A) Complet	te the following sentences :	(5 marks)
1. The	is the main control center in humans and animals dered the organ of sight in their bodies.	bodies, while
2. Tarsier de	pends on the sense of in weak light levels, vending on its sense of	vhile dolphin can
In the eyes mirror,	s of animals, there is a tapetum lucidum that	tlight like a
4. Paper and	t a piece of cloth are considered surfaces the	at diffuse or scatter
(B) Cross out	t the odd word :	
	ndle – The Moon.	()
2. Fishing car	t – Owl – Dolphin.	()
(1) (1) (1)	4	
(A) Write the	e scientific term of each of the following :	(5 marks)
	e scientific term of each of the following: hings that give off their own light.	(5 marks)
 They are the saving 	hings that give off their own light. Ig structural adaptation that gives fishing cat excel	()
 They are the saving of the savi	hings that give off their own light. ng structural adaptation that gives fishing cat excel n.	() Itent
 They are the saving the saving	hings that give off their own light. In structural adaptation that gives fishing cat excel In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excellent that gives fishing	() lient ()
 They are the saving of the savi	hings that give off their own light. In structural adaptation that gives fishing cat excel In. In piper that allow light to pass through. It is form of energy that travels in the form of waves	() lient () ()
 They are the saving of the savi	hings that give off their own light. In structural adaptation that gives fishing cat excel In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excell In a structural adaptation that gives fishing cat excellent that gives fishing	() lient () ()
 They are the saving of the savi	hings that give off their own light. In structural adaptation that gives fishing cat excel In. Objects that allow light to pass through. Ile form of energy that travels in the form of waves ing cat and bat are nocturnal animals. Explain the nem depends on to have a page.	() lient () ()
1. They are the 2. A life-saving night vision 3. They are of 4. It is a visib (B) Both fishing each of the same same same same same same same sam	hings that give off their own light. In structural adaptation that gives fishing cat excel In. Objects that allow light to pass through. Ile form of energy that travels in the form of waves ing cat and bat are nocturnal animals. Explain the nem depends on to have a page.	() () () () se sense on which
1. They are the 2. A life-saving night vision 3. They are of 4. It is a visib (B) Both fishing each of the same same same same same same same sam	hings that give off their own light. In structural adaptation that gives fishing cat excel In a structural adaptation that gives fishing cat excel In a structural adaptation that gives fishing cat excel In a structural allow light to pass through. It is form of energy that travels in the form of waves In a cat and bat are nocturnal animals. Explain the In a structural animals. Explain the In a structural animals. Explain the In a structural animals.	() () () se sense on which





Learning outcomes

By the end of this concept, your child will be able to:

- Compare solutions that use patterns to transfer information.
- Develop a model of a communication system with many parts that work together to transfer information from one place to another.
- Argue, using evidence, that light and sound allow for the transfer of information through systems of communication.
- Compare innovative human designs to systems of communication in the natural world.
- Design, test, and evaluate models of information-transfer systems that can send and receive coded information.

Ney vocabulary

- Code
- Satellite
- Echolocation
- System
- Pitch

Notes For Parents On Concept [1.4]

Lessons	Activities	What you should do with your child
	Activity 1	Discuss with your child the different ways that humans and animals can communication.
4	Activity 2	Discuss with your child the way through which fireflies communicate,
	Activity 3	Optional digital activity.
	Activity 4	Let your child classify the different types of communication used by humanimals or both of them.
2	Activity 5	Discuss with your child the way of communication that humpback whale
2	Activity 6	Explain to your child the meaning of "code" that humans can use to transfer information.
3	Activity 7	Explain to your child the meaning of "Morse code" and help him/her to do a smeexperiment that shows this code.
	Activity 8	Discuss with your child the way through when honeybees communicate each other using some special movements.
4	Activity 9	Optional digital activity.
	Activity 10	Explain to your child how ants communicate with each other.
_	Activity 11	Help your child to think like a scientist by writing his/her claim, evidence scientific explanation about a certain question on this concept.
5	Activity 12	Let your child know the similarities and differences between the special of the blind person and the bat echolocation property.
6	Activity 13	Let your child review the main points in this concept.









How can humans and animals receive and send information?

- You have learned from the previous concepts how humans and animals adapt by using their senses to gather information about the environment around them.
- Now, we will learn how do humans and animals use light and sound to send and receive information?
 - 1 Human can communicate by receiving and sending information through speaking, writing, reading . etc.
- 2 Fireflies beetles produce flash lights to warn off predators or to attract a mate.
- 3 Humpback whales communicate with each other by using the songs they produce as tones to make music.
- From the previous explanation, we can conclude that animals and humans send and receive information with different communication systems.
- ▶ In this concept, we will study : -
 - Firefly light show.
 - Song of whales.
 - Animals communicate with movement.
- Alphabet and written language.
- Transferring information.
- Communication systems.

Activity 2 Firefly Light Show

- ▶ Look at this picture, then put (√) or (×):
 - Fireflies beetles are considered as a type of fish.
 - 2. Fireflies can produce light.



How do fireflies beetles produce the lights they use to communic

- Fireflies beetles are type of insects that can produce a chemical reaction ins their bodies that allows them to light up and communicate with other fireflies
- How do fireflies use their senses to communicate?
 - Fireflies use their wings to form different flash patterns to :
 - Warn off other fireflies from predators. - Attract a mate to reproduce.
 - 2. They flash at regular periods of time, but if there is another group of fireflies flashing nearby, they will change their own flash pattern to match the flash pattern of the other group to communicate.
- ▶ The interaction between humans and nature :
 - A group of artists use flashing LED lights to imitate the nature of the fireflies patterns as follow:
 - The artists turn on and off the flashing lights in the forest at regular periods of tin in a pattern.
 - A large group of fireflies responded by flashing back the same flash pattern the same time.

Note

Humans use lights to communicate with each other to transfer information such as using traffic lights.

-	
- M	-
- 1971	(A)

zek your understanding

Complete:

Fireflies produce a inside	their bodies that all
and with each other,	their bodies that allows them to



Optional Digital Activity

Activity 3 * Alphabet and Written Language * in the school book is an optional di activity. You can do this activity by scanning its QR code found in your school book.

chemical reaction regular

pattern تفاءل كيميائي partists artists imitate غابة

traffic lights لمط / أسلوب interaction فناس

أنفولية

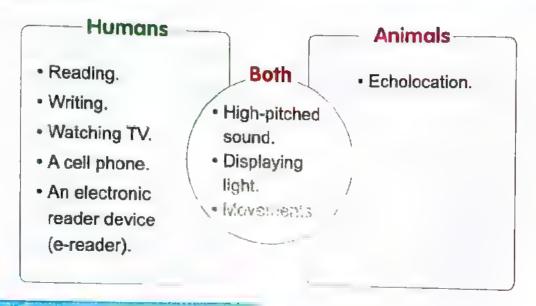
Activity 🔼

What Do You Already Know About Communication and Information Transfer?

 There are some similarities and differences between types of communication and transferring information in humans and animals.



▶ The following figure shows some different types of communication in humans, animals and both :



- Birdin - -

Check your uniterestable

- Choose the correct answer:
 - 1. Both humans and animals can use all the following types of communication exceptwhich are used by humans only,
 - a. sounds
- b. lights
- c. movements
- d. cell phones
- 2. is considered a type of communication used by animals only.
 - a. Writing
- b. Echolocation
- c. Reading
- d. Cell phone

In the Assessment Book:
Try to answer:
Self-Assessment 18

Exercises on Lesson 1

Evaluate Understand · Analyze Apply 11 Choose the correct answer: 1. A firefly is not a bird, but it is a type of d. reptiles. a. amphibians. c. beetles. b. lizards. 2. Which of the following is not a reason for fireflies to produce a flash light? a. To attract a mate. b. For communication. c. To warn off predators. d. To hear in the dark. 3. Changing the pattern of lighting up in a firefly is an example of adaptation(s). a. structural and behavioral b. physical and behavioral c. only structural d. only behavioral 4. People can use the following ways to communicate, except a. reading. b. writing. c. speaking. d. flying. 5. The ability to communicate through language and speech separates from animals. a. humans b. animals c. plants 6. Reading and writing are common types of communication in non living; world. (Giza a. humans b. animals c. birds d. plants a. plants and animals. b. plants and humans. c. animals and humans, d. plants and non living things. 2 Choose from column (B) what suits it in column (A): (A) (B) a. is a type of communication in plants only. 1. Watching TV b. is a type of communication in animals only. 2. Echolocation c. is a type of communication in humans only. 3. Displaying light d. Is a type of communication in both animals and humans. 1. 2, 3, 3 Put (🗸) or (X) : 1. Fireflies produce flash lights to warn off predators. 2. Humpback whales can communicate with each other by songs.

 3. Fireflies are wingless beetles. 4. It is possible for a human to interact with fireflies. 5. Speaking is the only way to communicate with people. 6. Echolocation is a type of communication between owls. Correct the underlined words: 1. Fireflies produce a physical reaction inside their bodies that allows them to light up. 2. A cell phone is a device that is used in communication between anim 	() () () () mals.
 Complete the following sentences: 1. Fireflies use the sense of to communicate with each other, when humpback whales use songs to	s produce their bodies f another through Egyptian and of
6 Give reasons for: 1. Humans receive and send information through speaking, writing and	reading.
 2. Fireflies use different patterns of flash lights to communicate with each 3. Fireflies produce a chemical reaction inside their bodies. 	
or richies produce a oriental	

2. A firefly wants to attract a mate to reproduce.

Understand

Put (V) in front of the way of communication used in each of the following

Items	Light	Sound	Both
1. Car lamps.			
2. Television.			
3. Traffic lights.			
4. Radio.			

Solution Look at the following photos, then put (\checkmark) or (x):



Figure (1)



Figure (2)

- 1. The sense that is used to communicate in photo (1) is sight only.
- 2. The way of communication in both photos can be used by humans.
- 3. The way of communication in photo (1) can be used by animals only.
- 4. The way of communication in photo (2) can be used by humans only.



Activity 5 Song of Whales

▶ put (√) or (x):

- 1. Fireflies communicate with each other through sounds.
- 2. Humans communicate with each other through language.

In this activity, we are going to study how a type of whales communicate with each other under water.

Humpback whales

- Humpback whales sing under water to communicate with each other, where they sing a wide range of notes (tones) and a series of songs.
- The songs of humpback whales have different sounds depending on the season, where:



In winter in summer

- It is the mating season.
- Their songs have high-pitched sounds Their songs have low-pitched sounds which travel better through cost water. (High-pitched sounds such as the sharp voice of a woman).
- It is the feeding season.
 - which travel better through warm water. (Low-pitched sounds such as the rough voice of a man).

Check your understanding

Choose the correct answer:

- 1. The rough sound of humpback whale is pitched sound.
 - a. high b. low
- c. soft
- 2. The songs of humpback whales have a pitch in winter.
 - a. higher

b. lower

c. rough

Activity 6 Transferring Information

- Sense organs collect information about the world around us then send signal the brain through nerves for processing and understanding.
- The senses can also be used to communicate, or share information with other

Where,

- Ears detect sound energy to gather information from the environment and communicate with others.
- Eyes detect light energy that can travel very fast over different distances to gather information from the environment and communicate with others.
- Examples of information that the eyes receive :



Seeing the red traffic light means that you must stop.



People use a rescue flare to get help.



People use signal fires to communicate over distances of many kilometers.



Many hikers (travelers) use mirro to attract the attention of rescue helicopters.

Codes and transferring information:

- Humans use codes to transmit information.

Code:

It is a pattern that has meaning

Examples:

 Thumbs-up or thumbs-down and traffic lights can be used to express simple meanings like good, bad, stop and go ... etc.





- Expressions on faces are codes that can help people predict our feelings such as happy, sad, angry ... etc.
- Language: is a code in the form of sounds, where different languages are different codes that are used to transfer information.





- Writing: is a code that uses symbols in a pattern to give a specific meaning according to the arrangement of letters in a word.
- Music or Sounds: different sound tones produced from humans or musical instruments can be used in communication.





 Lighthouses send codes in the form of flashes of light that tell sailors where they are.

When sense organs receive this information and send messages to the brain, the brain decodes and interprets the meaning.



Check your mile sanding

▶ Complete :

- Sense organs collect information about the world around us and send signals to the through for processing and understanding.

 The
- 2. The is a pattern that has meaning.

In the Assessment Book:
Try to answer:
Self-Assessment (19)

thumb express expressions predict

feelings الأبهام Instruments يعبر Ighthouse التعبيرات يتنبأ/يتوقع decode مشاعر interpret اللات / الأدوات sailors

بحل شفرة يفسر

Exercises on Lesson 2

The second secon	and the second s	- Angly Til	• Evaluate	00
derstand	Apply	Allalyse		
hoose the correct	answer:		table the mating s	00.
. Humpback whale	s sing during	F 2500 H 190		
. Songs of humpba	ack whales in W	inter are charac	terized by each of	the fol
a. having high-pit	ched sounds.	h travelling l	etter through cold	
. All of the followin	g are forms of o	b. faces expr	essions.	(Ismai
a. increase your	speed.	b. decrease	your speed.	
		•		ng on
a. hearing.	b. sight.	c. smell.	d. touch.	
 Sense organs co understanding. 	llect information	n and send signa		essing Port Sa
a. hands	b. legs	c. brain		
a. they can comb. they mating inc. they have a w	nunicate in colo winter months. eak hearing ser	l and warm wate nse.	r	
				ıt
a. green traffic lig	ght.	 b. fire alarm. 		
c. signal fires.		d. rescue flar	Θ,	
Choose from colur	nn (B) what sui	ts it in column (#	N):	
(A)			(B)	
	c. is a coo	de that means that de that means that	ck whales in winter. at you are in a dang	
	hoose the correct Humpback whate a. winter Songs of humpback except a. having high-pit c. having soft sou All of the following a. thumb up and c. writing. When your eyes a. increase your c. keep your spect People use a rest sense of a. hearing. Sense organs counderstanding. a. hearing. All the following st a. they can commode they mating in c. they have a we d. they communicately an organicate c. signal fires. Choose from column (A) 1. High-pitched sou 3. Thumb-up	Humpback whales sing during a winter b summer. Songs of humpback whales in wexcept a having high-pitched sounds. c. having soft sounds. All of the following are forms of cathumb up and down hands. c. writing. When your eyes see a red traffication increase your speed. c. keep your speed as it is. People use a rescue flare to consense of a hearing. b sight. Sense organs collect information understanding. a. hearing. b legs All the following sentences descathey can communicate in cold b they mating in winter months. c. they have a weak hearing ser d. they communicate with each of they communicate. (A) 1. High-pitched sound a lis product. (B) what suite a cold b lis product. (C) lis a cold d list a c	hoose the correct answer: Humpback whales sing during	hoose the correct answer: Humpback whales sing during

3		ut (/) or (x) :	
÷	1.	Animals communicate with each other by using different senses.	()
•	-	Triales communicate with each ather there is a starting	()
•	٠.	The state of comments of comme	()
•	4.	Humpback whales can sing under water.	()
•	5.	Sense organs can decode the information that is sent by the brain.	()
	6.	Expressions on faces are codes that can help people predict our fe	()
		and the second of the second o	elings. ()
4	JU	orrect the underlined words :	
	1.	Humpback whales have similar sounds according to the season.	()
	۷.	Trumpback whales produce low-pitched sounds in winter	()
	3.	Low-pitched sounds travel better through cold water	()
	4.	Different languages have similar codes.	()
	5.	Light travels very slow over distances.	()
5	w	rite the scientific torm of	
-	4	rite the scientific term of each of the following:	
Ĭ	1.	A season in which the humpback whale produces high-pitched soul	
	2.	A season in which the humphortonic	()
		A season in which the humpback whale produces low-pitched soun	d.
•	3.	Pitched sounds which travel through cold water better than through	()
		warm water.	
•	4.	Pitched sounds which travel through warm water better than through	()
		cold water.	()
•	5.	Sense organ that can detect sound energy.	()
•		Comments	()
•		It is a pattern that has meaning.	()
6	la	omplete the following sentences:	
ī			
	•	Humpback whales communicate with each other by using the sens	e of
•	2.	In winter months, the songs of humpback whales have pi	tohod sound
		because these sounds travel better through water.	ioned Sound,
•	3.	. In months, the songs of humpback whales have	. pitched
		sound, because these sounds travel better through warm water.	· ferresses
	4.	Humans can communicate with each other where ears of human de	etect
		anergy and eyes of human detect energy	

4. The voice that is produced in picture (......) is similar to the sound of

5. The voice in picture (.....) travels better through cold water. 6. The voice in picture (.....) travels better through warm water.

humpback whales in winter season.





Activity 7 Inventing a Code

Complete the following sentences:

- 1. Communication through the sense of sight needs energy.
- 2. Communication through the sense of hearing needs energy.

In this lesson, we are going to study one of human code systems known as "Morse code" which uses light or sound that allows humans to communicate with each other.

Morse code:

- 1. It is a communication system developed by Samuel Morse in the 19th century.
- 2. It is a simple code consists of short beeps known as dots and long beeps known as dashes. Different dashes and dots represent different letters of alphabet.
- 3. This code allows people to spell words using patterns of sounds (long and short beeps) or lights (long and short flashes)



Morse code device

MORSE CODE ABCDEFG HIJKLMN OPQRSI

 Now, we will invent a code that is similar to Morse code in this experiment to send and receive messages without talking.

Tools



A small drum



Pencils



Notebooks

Steps

1. Share one of your friends to create a unique code (signal) for every letter of the alphabet using small drum.

- In a notebook, write a unique message that is no more than five words (without being seen by your friend).
- Send your encoded message as a sender by using the drum according to the code you have created.
- Your friend will decode your message as a receiver according to the code you have created.
- Compare with your friend the message that he was received to the original message you have wrote in step (2).



Note

In this activity you can use a flashlight instead of the drum to create codes of the alph

Observations

- You and your friend may have incorrectly sent signals or incorrectly interpreted the
- Your code may have included the same encoding for more than one letter.

Conclusion

- We can send encoding message to communicate with each other through different ways such as :
 - 1. Using light energy that depends on the sense of sight.
 - 2. Using sound energy that depends on the sense of hearing.

₽ Note

To improve your code you can simplify your code.

日日

Check your understanding

- ▶ Put (√) or (x):
 - In Morse code, we use sound to send encoding message to communicate with each other.
 - 2. Morse code consists of long beeps known as dots and short beeps known as dashes.

In the Assessment Book
Try to answer:
Self-Assessment 20

Exercises on Lesson 3

Understand	The state of the s			
	O Apply	• Analyze	• Evaluate	
11 Choose the	correct answer:	_		• Create
 1, Different a. symbols c. figures a 	represent differ and figures and dots	D. Sympo	is and dashes	
as dashes.	e consists of	beeps known as d	ots and	beeps known
a 2 In Moreo o	short b. long – lo	ng c. short -	long d. lo	ng – short
a. long bee	eps.	ne following patter b. short t	ns, except Deeps.	••••
	es and Morse code ca b. light	C notent	iol	
	ons communicate with that the sender and the numerication, b. sight	h each other by M the receiver will de c. taste	orse code using epend on the se	light flashes,
2 Put (v') or (x)			d. sr	nell
in continunt	may use long and s		(Alexandria	()
Write the scie	ntific term of each o	of the following.		
	cation system develo			
the 19 th cen	itury.	ped by Samuel M		,
	eeps in Morse code.			()
	eps in Morse code.			()
				(11111111111111111111111111111111111111
	following sentences			
1. Morse code orene	is asystem thergy.	at depends on	energy	
• 2. Morse code i	is a simple code that c	onsists of be	eps and be	eps.
	eps in Morse code a			•
• 4. Communica	tion by Morse code of the used pattern.	depends on our se	nse of or .	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

The opposite table shows some encoded letters according to Morse code where short beep means a dot and long beep means a dash.

Try to decode the following word that is represented by the following codes in the table below:



The code	The letter
1 Short beep, long beep	
2 Long beep, 2 short beeps	
3 Short beep, long beep	
4 Short beep, 2 long beeps, short beep	.,,
5 Long beep	
6 Short beep, long beep	
7 Long beep	
8 2 Short beeps	
9 3 Long beeps	FF P47 T T T T T A A A 4
10 Long beep, short beep	

11) The decoded word is



Activity 8

Animals Communicate with Movement

▶ put the suitable word in front of each sentence : [Fireflies - Humpback whales]
1. Living organisms that can communicate with each other by sounds /
2. Living organisms that can communicate with each other by lights.
In this activity, we are going to study how honeybees use movements to
communicate with each other.

Bees and how they communicate with each other:

they do special dances
that represent a code
to communicate
with each other.

The movements
of this dance tell the
other bees the correct
direction and distance
to food and water
resources.

The scout bee
(dancing bee) moves in
a figure-eight pattern,
while vibrating its
wings.

The other bees read the code of the dancing bee and then fly off to the specific location.

Note

From the previous explanation we can observe that the other bees receive these codes through the sense of sight.

Coding with honeybees:

- The scout honeybee faces the direction of the flower where :

If the flower is very close:-

البحلة لكشافة

The bee does one round dance.



bees hive dance

scout bee

vibrating النحل direction خلية النحل distance رقص

resources المدرار specific الجاء iocation

مصادر محدد موقع

If the flower is far away:

The bee does a waggle dance to the right and then to the left and this is considered as one dance where:

- One dance = The flower is a little farther away.
- Three or more dances = The flower is far away.



Humans use movements to communicate between each other such as

- Sign language that is used by people of special needs.
- Simple gestures like when you shake your head to say "No".



Sign language



Check your understanding

▶ Complete :

- 1. In the hive, bees can communicate to find and and resources by doing a special dance.
- 2. People of special needs use to communicate with each other.

▶ Choose the correct answer:

- - a. one waggle dance.
- b. one round dance.
- c. two waggle dances.
- d. two round dances.
- 2. and depend on the sense of sight in their communication
 - a. Bees bats

b. Fireflies - humpback whales

c. Bees - fireflies

d. Humpback whales - bees



Optional Digital Activity

Activity 10 How Animals use Communication Systems

- Technology systems allow humans to communicate with each other through :
 - Making phone calls.
 - Sending text messages and e-mails.
- Animals don't use technology systems as we do, but they can still use other systems to communicate with each other.
- We will study ants as an example of these animals.

Ants:

- Ants live in colonies that contain thousands of individuals.
- Groups of ants within a colony have different roles, where they have developed systems that help them divide their work among themselves, so there are nurse ants, scout ants and soldier ants.



How do groups of ants communicate with each other?

When the food is low, nurse ants send smelly messages to scout ants which are responsible for locating food.

The scout ants respond by sending a smelly message to alert the ants where to find the food

Nate

The soldier ants also use smelly messages to communicate if there is danger nearby.



▶ Comp	lete:
--------	-------

- 1. When the food is low, ants send to to ants which are responsible for locating food.
- 2. The ants use smelly messages if there is danger nearby.

In the Assessment Book: Try to answer : Self-Assessment (21)

calls scout ants colonies

thousands مكالمات individual النمل لكشاف elor مستعمرات

nurse ante soldler ants فرد alort عاملات الذمل nearby جبود اسمن

فريب / مجاور

Exercises on Lesson 4

The Control of the Co		and the first state of the stat	O Evaluate	
Understand	O Apply	• Analyze		C
Choose the corr	ect answer :	We each O	her is	
a. echolocatio	n. b. flash light.	c. dancing.	u. Moroo cou	
message for o		c. 6	d. 8	-ricog _i
• 3. The scout hon	b. 4 eybee makes b. 2			close,
4. The scout hon flower is a little	eybee performs a		he direction	if the
a. right-left5. Sending smell	b. up-down	c. right-down		No.
OT				
 6. Locating food 	b. nurse ants. is the role of		d. soldier ants	
a. queen ants.7. Alarming the c	b. nurse ants. colony from danger			
a. queen ants.	b. nurse ants.	c. scout ants.	d. soldier ants.	
Choose from co	lumn (B) what suit	s it in column (A) :		
(A)		(B)		
 Nurse ants Scout ants Soldier ants 	c. are responsib	ole for reproduction ole for warning from ole for locating food ole for sending sme od decreases.	n dangers.	
1	2	3	445421)	
friends.	pecial needs use si	gn language to cor is not a way of con	nmunicate. Imunication with y	our (
 3. Bees use flash 4. Animals use to 	n light to communic achnological systen	ate with each others as we do.	r. (Damitta 2	2022) (

Correct the	underlined words :	
1. In the hiv	e, bees can communicate to find waste and water resor	
	waste and water resol	
2. The dance its wings.	cing bee moves in a figure- <u>six</u> pattern while vibrating	(
3. Scout hor other bee	neybees use movements codes to communicate with	(
	these codes through hoseles	(
F. Coout and	of ants within a colony have similar roles.	(
5. Scout and	ts are responsible for alarming the colony in danger.	(
Write the so	cientific term of each of the following :	
1. Honeybee	es which are responsible for searching out food resource	· ac
	e by which bees receive movement codes that are sent out honeybees.	
3. Small livin	ng organisms that live in colonies and communicate with er by smelly messages to perform different roles.	(1
4. A group of	f ants which is asset to perform different roles.	(
when ther	of ants which is responsible for sending smelly message	S
		(
Complete th	he following sentences:	
1. Honeybee	es use movements in their communication to find	and
2. The bee d the other to location.	tances in a figure-eight pattern while vibrating itsbees read the of the dancer and than fly off to	, and the specific
3. The people by a langu	le with special needs use movements to communicate vage called	with each other
4. Ants within	n a colony are divided into several groups such as ants andants, where each group do a specific	ants,
5. Ants use t	their sense of to communicate with each other	: while hees
use	by doing special dances to communicate with each	other
6. A group of	f ants sends messages to communicate with e	and other
. Ants are s	similar to the tree in that both of them send a s	melly
	s for communication.	
Community	oneybees and fireflies use the sense of in their	•
communic	cauon.	(Cairo 2022)

with other bees.

7	Give reasons for : 1. A honeybee makes figure-eight pattern	sevement as a way of communication
•	1. A honeybee makes figure-eight pattern	MOVERNOON

Understand

- to telegraphics of 3 telegraphics of the telegraphic and the telegraphic depletation and the telegraphic and telegraphics and telegraphics are telegraphics. 2. The nurse ants send smelly messages to scout ants.
- 3. The soldier ants use smells in their communication.

8 What happens if ...?

1. The bees in the hive didn't understand the movements of the dancer bee.

- A person with special needs doesn't learn the sign language.
- The smell sense of ants becomes weak.
- The amount of food in the ants colony decreases.
- There is a danger near to an ants colony.

Look at the following pictures then complete the following seamentes:



Picture (1)



Picture (2)

- 1. Insects in picture (......) communicate with each other by the sense of smell, while insects in picture (.....) use the sense of sight to communicate with each other.
- 2. Insects in picture (... ...) make a special dance to tell the other members in their colony where to find their food and water.
- 3. Insects in picture (......) send smelly messages to the other members in their colony to tell them where to find the food.



Activity 111

Record Evidence Like A Scientist

- ▶ In this concept, you have learned a lot about humans and animals communication and transfer information using sound, light and movement.
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learnt in the previous concepts.

o send and receive information	use light, sound and other methods like moveme in ?
Step 2 My Claim	
4010000 4100000000000000000000000000000	***

######################################	
Step 3 My Evidence	

Step (4) My Scientific Ev	colonation
Step 4 My Scientific Ex	(planation

Activity 12 S T E M in Action

Technology Inspired by Nature

- Bats use sound in some purposes such as:

 - Getting information about their surroundings using their hearing sense.

How does the bat use its ears for echolocation to get inform about its surroundings in the dark?

> The sound hits something nearby the bat and reflects back to it in the form of "echo".

Bat makes a high-pitched sound.



Bat listens for the e (reflected sound)

So, bat knows that # is something nearly

Bat Inspired technology:

- Scientists have been inspired (get benefited) by the adaptation of bat echolocate to find ways to help blind people detect their surroundings, where :

Scientists have created a special cane that emits a high-pitched sound just like bats do.

As a blind person is walking with this special cane, an echo of this high-pitched sound is picked up by this special cane.

The echo is turned into vibrations that the person can feel with his thumb.

The vibrations of the special cane tell the blind person the direction of the obstacles and objects around him.



Note

Humans cannot hear the high-pitched sounds produced either from bats or the special

In this table we can summarize the similarities and differences between the special cane of blind person and bat echolocation.

Special cane of blind person

Bat

Similarities

- The special cane of blind person and bats emit a high-pitched sound that bounces off objects as an echo.
- This special cane and bats receive the echo that can tell how far away objects are.

Differences

- This special cane picks up an echo from the sound it emits and changes it into a vibration that can tell the blind person where objects are around him.
- Bats pick up an echo from the sound they emit but they don't change it into vibrations.

How are the special cane of blind person and the honeybee dance similar?

- Honeybees make a series of movements and vibrations with their wings to communicate the flower location to other bees.
- The special cane makes a series of vibrations to tell to the blind person using it where objects around him located.

Check your understanding

▶ Put (√) or (x):

	7
 Bats make low-pitched sound and then listen for an echo. Bats can change the echo into vibrations. 	1

Bats can change the echo into vibrations.

n	the Ass	essment Book	+
	to ansv		
		sment (22)	
_	,	andit (CZ)	

Exercises on Lesson 5

Hills, L. s.Americo.			• Evaluate	100
- Manual and Marine Consumer Manual Consumer Con	Market Charles and State of St	• Analyze		
■ Understand	Apply			
Choose the corre 1. Bats use their	ct answer:	tion about their s	surroundings	in the dark
• 1. Bats use their .	to get inform	ation apos	d. ears	(Gh _{arbi,}
a. nose • 2. Echolocation in	b. tongue	c. eyes	tched sounds	for finding
• 2. Echolocation in	some animals is the	16 fise of when he	d. high	
a. medium	b. low	c. very low	ounds in the a	air.
a. medium • 3use echo	location by bounci	ing high-priched s	d. Snakes	
a. Bats	b. Dolphins	c. Whales	fool in his thu	mb while
a. Bats 4. The echo is turn	ned into that	t a blind man can	leer me me	
holding his spec	cial cane.		d. water	
a. vibrations	b. light	c. heat		OUTDOS A
a. vibrations5. The blind persor	n's cane and	emit a high-pitche	d sound that t	ACTURES OF
objects forming	an echo.		d. bats	
a. lizards	b. polar bears	c. bull sharks	U. Data	
 1. It is impossible organisms arou 2. A special cane is 3. The sound pitch 4. Echo is turned i special cane. 5. Bats have the a of blind persons 	nd us. invented to help a from a blind pers nto light that a blin bility to change ed	person who has lo on's cane is too h nd man can feel w	ost the self e o igh for human hile holding hi	of hearing. ns to hear. is
B Write the scientif				
 1. A living organism to get information 	m that can fly and on about its surrou			perty (
2. A simple tool (de				(
4 Complete the foll	owing sentences :			
 1. Bats and the sp property to loca 	ecial cane of blind	people are simila	r in using	
- a Honeybee vibra	tes Its to	tell other bees th	6 le 11	أطب

the special cane of a blind person makes a series of to tell him whi

objects around him are located.

3. The echo that is picked up by the special cane of a blind person is turned into that the person can feel them with his thumb.			
Give reasons for :		-	
 1. The echo that is picked u vibrations. 	p by the special cane of blind (people is turned into	
 2. The blind people cannot 	hear the sound that emits from		
6 What happens if ?			
1. High-pitched sound that i	s produced by the blind person	n's cane hits an object.	
2. Bats cannot use echoloca	ation property.		
3. There is a wall in front of	a blind person uses his specia	al cane.	
7 Cross out the odd words :			
1. Bats – Humpback whales	s - Hensybees - Dolphins.	()	
2. Bats – Fireflies – Blind pe		()	
8 Look at the following pictu	ures then complete the follow	ing sentences :	
Picture (1)	Picture (2)	Picture (3)	
 Picture () is similar to property. 	to picture()in that both o	f them use echolocation	
Picture () is similar deliver communication management	to picture () in that both onessages.	of them make vibration to	

• Understand

Material , Confession :

And then mention the name of	Inspired from the adaptation
Devices	
1	
2	



Activity 13

Review: Communication and Information Transfer

- We can summarize this concept in the following main points:
 - Humans and animals use variety of ways to communicate with each other as sound, light and movement.
 - Fireflies beetles produce different flash patterns to warn off predators or to attract a mate.
 - **Humans** can communicate by receiving and sending information using language by speaking, writing and reading.
 - Humpback whales sing under water to communicate with each other.
 - In winter, the songs of humpback whales have high-pitched sounds that travel better through cold water.
 - In summer, the songs of humpback whales have low-pitched sounds that travel better through warm water.

Code:

It is a pattern that has meaning.

- · Humans use codes to transfer information.
- Morse code is a simple code that consists of short beeps (dots) and long beeps (dashes).
- Bees use movement to communicate with each other to find food and water resources by doing a special dance that represents a code.
- Humans use movements to communicate as sign language or simple gestures.
- Ants communicate with each other through their sense of smelt.
- Scientists created a special cane that emits a high-pitched sound just like bats do to help blind people detect their surroundings.

In the Assessment Book:
Try to answer:
Model Exam on Theme 1

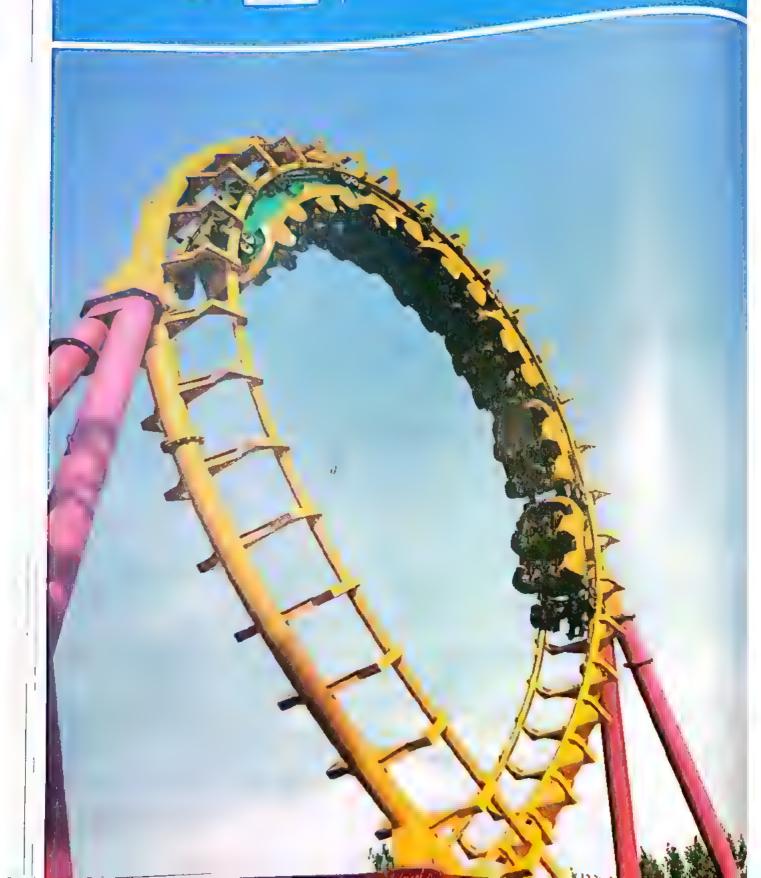
Model Exam on Concept (1.4)

(A) Choose the co	rrect answer :		(5
1 can com	municate by dist	laving light.	
a. All animals	inditicate by disp	L All niants	
c. All plants and	animals	d. Humans and	some animals
2. The mating sea	ran in which the		
a. autumn.	b. summer.	c. winter.	d. spring.
3. When we comm	nunicate by Mors	se code using dots a	and dashes, this means
we use the sens	se of		
a. touch.	b. hearing.	c. taste.	d. smell.
Bees can comn	nunicate with ear	ch other by	
 a. Morse code. 		c. flash lights.	d. echolocation,
(B) Give a reason	for the followin	q:	
The hearing sense			
			341
(A) Put (V) or (X)	:		(5
		on's cane is too high	for humans to hear.
2. Tarsier can use			
3. Humpback wha	les produce only	y one type of songs.	1
		eir communication.	1
(B) What happens			,
The amount of for		decreases.	
(A) Complete the	following sente	ences :	(5#
1. Lighthouses se	end codes that de	epend on our sense	of while music is
a code that de	oends on our ser	1se of	or in Wille Musicis
2. In month because these	s, the songs of h sounds travel be	numpback whales ha etter through warm w	ve pitched sound,
3. Bats use			
to communicat	such as us e with each other	e movements by doi r, while ants use the	ng special dances ir sense of to

Comment	in curonse file Ci	se of hearing are used in diff orrect answer :	
1. Which of the fol	lowing communic	cations depends on the sense	e of sight only ?
a. Watching TV.c. Echolocation	in dolphins.	 b. Flashing lights of fireflie d. Using the cell phone. cations depends on the sense 	9 8.
a. Echolocation c. Flashing light	in bats.	b. Rescue flares. d. Traffic lights.	e of nearing only ?
(A) Write the scie	ntific term of ea	ch of the following:	(5 marks)
1. A device used b	y blind people to	walk safely.	()
2. A group of ants is a shortage of	which is respons food.	sible for sending smelly mess	ages when there
3. It is a pattern th	at has meaning.		• • • • • • • • • • • • • • • • • • • •
4. The short beeps	s in Morse code.		(
(B) Choose from c	olumn (B) what	suits it in column (A) :	•
(A)		(B)	
1. Bats	a. make a spec	ial dance to communicate wit	h each other.
2. Bees	b. 1136 echolocation during flying.		
3. Blind person's	c. a se Bash ligh	its to communicate with each	other.
cane	d. Francisco Vibrati	ons when recieve echo help to	find out direction.
· 中的克尔尔克克克·克特奇尔尔尔克	2	3	

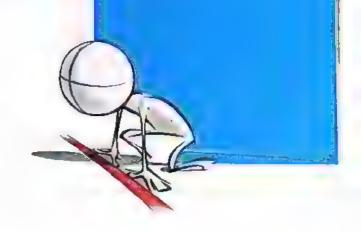
Theme Two: Maiter and Energy

§ 2 Motion



Get Started

What I Already Know



- . All objects need energy to start or to stop motion.
- . The opposite image shows a person in a wheelchair, where :
 - This person needs a small amount of force and energy to push the wheels of the chair to move down the ramp.
 - But, if this person needs to move up the ramp, so this person needs a larger amount of force and energy to push the wheels.



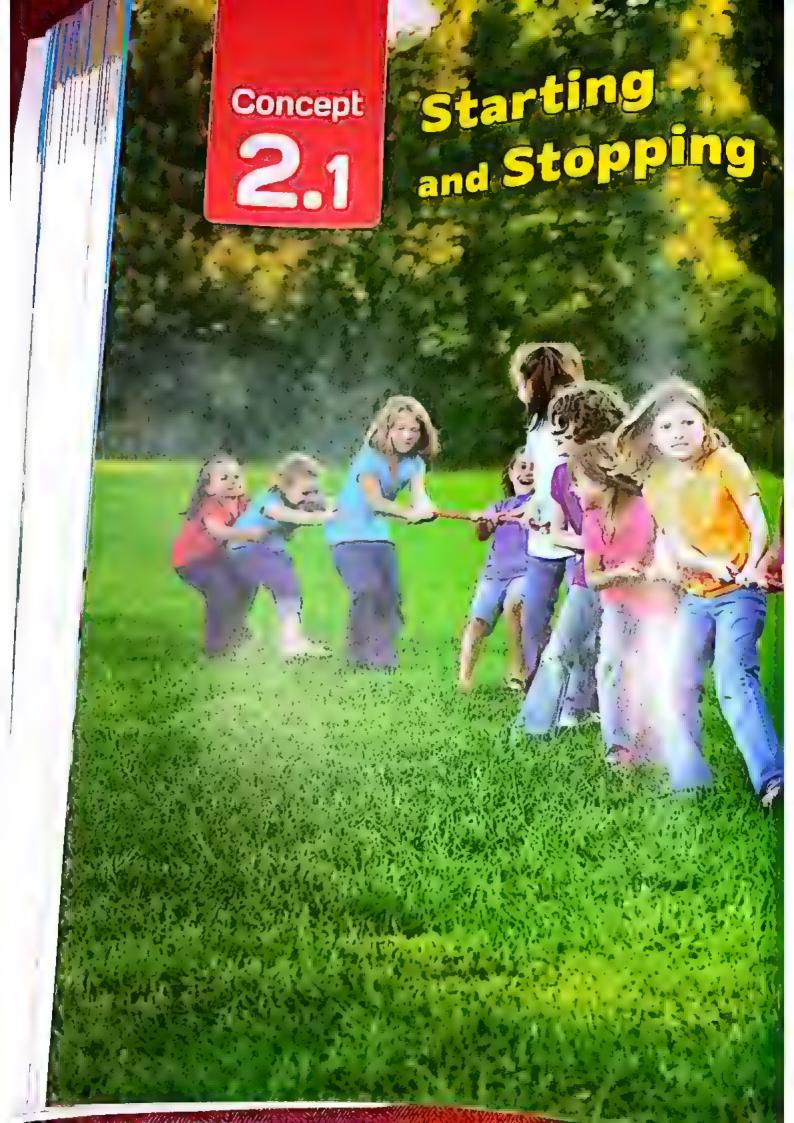
In this unit, your are going to study :

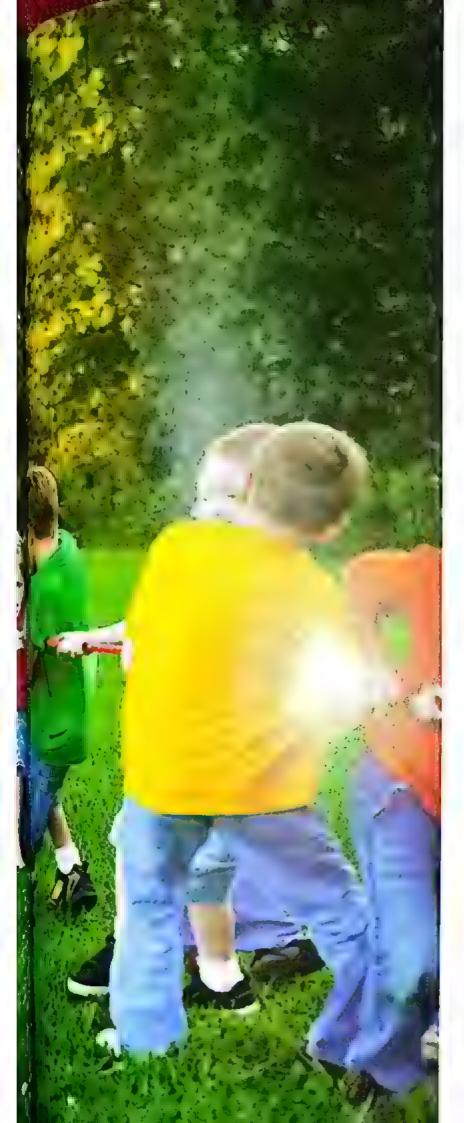
- How energy and motion are related.
- How energy changes when a force affects an object.
- The relationship between energy and work.
- How to observe and calculate the speed of a moving object.
- What happens when objects collide or crash together?

Unit project : Vehicle safety :

- Cars have a lot of safety features to keep the driver and passengers safe during crashes such as seatbelts and airbags.
- At the end of this unit, you are going to make a research project about one of the safety features in cars and create a plan to improve this safety features.







Learning outcomes

By the end of this concept, your child will be able to:

- Explain and model what causes objects to change motion.
- Analyze data to explain different causes of changes in an object's motion.
- Cite evidence to show how speed is related to energy for an object.
- Model the cause and effect relationship between the force acting on an object and the object's motion.

Key vocabulary

- Energy
- Gravity
- Force
- Motion
- Friction
- Work

- Activity 2 Truck Versus Airplane Look at the following pictures, then choose the correct answer:
- Which of the opposite objects moves faster?

(Truck - Airoplane)





Truck versus Jet airplane:

The engines on a jet airplane are much more powerful than the engine in a truck So, jet airplanes fly much faster than moving trucks.

The shockwave truck:

The truck in the opposite figure is known as "the shockwave truck" which has been fitted with three jet engines.



The shockwayer

How does this truck move?

The three jet engines make the shockwave truck reach speeds more than 500 kilometers per hour, which is about five times faster than the normal trucks.



How does this truck stop?

To stop this truck, engineers turner to the idea that is used in the rocks designs, where they installed three parachutes that the driver opens to help slow down the truck quickly.



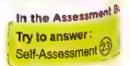
Check your understanding

▶ Complete the following sentences using the words below :

(faster than - slower than)

- 1. The speed of a normal truck is
- 2. The speed of the shockwave truck is that of a normal truck.

that of a jet airplane.



truck jet airplane engineer

filted with اشاحلة engine بطائرة نفاثة

installed مزودة بـ rocket

Exercises on Lesson 1

Understand	@ Apply	• Analyze	Evaluate	● Create	,
1 Choose the cor	rect answer :				
Choose the cor	ove something aw	ay from you, this rep	rosento		
1. When you fix	rce h light energy	/ C pulling force	d sound and		
		/. c. pulling force.		ərgy,	
		vard you, this repres			
		c. pulling force.			
		ered as types of		Alexandria 2	022)
a. force.		c. energy.		n.	
		a ball with your leg?			
a. Pull.		c. Sound,	_		
		more than that of	***		
a. a jet airplar	•	b. a jet airplane	and a rocket.		
		d. a bicycle only			
		ockwave truck to			
a. increase its		b. decrease its s	speed.		
c. keep its sp	eed as it is.	d. change its dir	ection.		
2 Put (//) or (x):					
	pair of socks need	ls a pushing force.		,)
		forward or backward	1.	(,
• 3. A car can mo	ve faster than the	hicycle.		(, 1
• 4. A normal truc	k can move faster	than the jet airplane		(,
* 5. The three let	engines in the sh	ockwave truck allow	it to fly	()
6. A normal truc	k is slower than the	ne shockwave truck.	it to fly.	(, \
7. Parachutes a	re used to slow d	own the speed of the	shockwaya tri	ıck	,
quickly,	ie daed to slow d	own the speed of the	SHOCKWEIVO II O	1)
3 Maria at					_
write the scien	tific term of each	of the following :			
1. A force that y	ou make to move	an object towards yo	ou.	(_
A force that y	ou make to move	an object away from	you.	(_
o. One of the fa	stest and most po	werful trucks in the v	vorld.	()
Complete the f	ollowing sentenc	es:			
1. The car can r	move or stop depa	ending on the change	of act	ing on it.	
GOII I	HOTO OF GLOP GOP				

- 2. When you kick the ball that standing on land, it starts to
- speed, and they installed three to stop it.
- 4. The idea of stopping the shockwave truck is the same idea of stopping
- 5. The shockwave truck starts to by the help of jet engines and starts
- 6. Engineers use parachutes to slow down the motion of the truck an to stop them.

Give reasons for :

1. The shockwave truck is faster than the normal truck.

to tectoric to a contraction of the parties

2. Engineers use parachutes in the shockwave truck designs.

6 What happens if ...?

- 1. You kick a stopped ball on the ground.
- 2. Engineers placed jet engines inside a normal truck instead of its normal eng

3. The shockwave driver opens the parachutes.

Look at the following figures, then complete the following sentences:



Figure (1): Normal truck



Figure (2): Jet airplane

- 1. The engine of figure (..... .) is much powerful than the engine of figure (.-.
- 2. When the engines of figure (......) are placed in the figure (......) it will turn the shockwave truck.
- 3. The engines that are used in figure (......) is the same engines that are USE the shockwave truck.

Activity 3 Making Things Move

)

)

Look at the opposite pictures, then put (√) or (×) in front of the sentences below:

- 1, The ball will move if the boy pushes it with (his foot.
- 2. The door will move if the person doesn't pull it with his hand.





• All objects around us cannot move without push and pull forces, where :

- Aball lying on the ground untouched does not move until someone pushes it with his foot to make the ball roll.
- A closed door untouched does not move until someone pulls the handle with his hand to open the door.

Can air provide enough force to move an object?

Air can move the leaves of a tree by the wind blowing.

Cart activity

- Some engineers fix fire extinguishers onto a cart.
- *When they release air from the fire extinguishers, the air moves backward that makes the cart begins to move forward.
- By increasing the number of fire extinguishers, the speed of the cart increases and the distance that it moves increases too and vice versa.



A cart with fire extinguishers

handle

jegves

Check your understanding

▶ Put (√) or (x):

- 1. Push and pull forces cause objects to move.
- 2. Air makes a force that can move some objects.

wind blowing بدحرج fire extinguisher أوراق لشجر cart هيوب الرياح release پئيت distance طفایة حریق عربة سياق صغيرة مسافة

213

Activity 4

What Do You Already Know About Starting and Stoppin

How do objects move?

There are two forces that cause objects to move which are



Pushing force

A man pushes a wheelbarrow.

Pulling force



A child pulls a toy car.

The relation between motion with balanced and unbalanced fr

In the two following pictures the children are playing tug-of-war, which st a rope being pulled in two opposite directions:



If the two teams are pulling the rope with equal forces, so the forces that act on the rope is balanced and the rope will not move.



If one team is pulling the rope w a greater force, so the forces the act on the rope is unbalanced an the rope will move towards the team with the greater force.

▶ From the previous example, we can conclude that :

- If there are balanced forces act on an object, so this object will not move.
- If there are unbalanced forces act on an object, so this object will move.



Check your understanding

- put (√) or (x):
 - 1. If an object moves, it means that the forces acting on it are balanced.
 - 2. The unbalanced forces cause objects to move.
- Complete the sentence below each picture, using the words "pushing" or "pulling":



1. The player uses the force to hit the ball.



2. The man uses the ... force to move his suitcase.



3. Children use the in tug-of-war game.



4. The boy uses the to move his skating board.

Activity 5 Objects in Motion

How do we know an object is moving?

- An object is in motion if it is moving from one place to another.
- When we look at an object, we can describe its position compared to other thing around it.

Motion:

It is any change in the position of an object relative to a fixed point,

Example of an object motion:

- Imagine that you are holding a ball and standing next to a tree when you are playing "catch".
- The starting position of the ball movement is close to the tree.



When you throw the ball from your hand, it will move by the pushing force through the air.



Then the ball will drop into your friend's hand by the pulling force of gravity.

Gravity:

It is the force that pulls objects down toward the Earth.



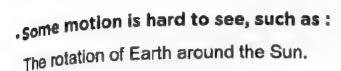
- The pushing force of your friend's hand against the ball will stop it.
- The position of the ball changes, relative to the tree.



Starting and Stopping

, some motion is easy to see, such as :

- . A person walking down the street.
- . A leaf blowing in the wind.
- . A ball traveling through the air after it is thrown.







From the previous examples, we can observe that :

- Any object is in motion if the position of the object changes, even if this change cannot be seen.
- The change in position of an object is compared to something else that is not usually moving (fixed point).



▶ Complete the following state that sure the words below:

(pull - position - force - motion)

- 1. A must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion, so the must act upon a ball to start motion.
- 2. There are two types of force which are a push and a ____ that cause the ____ of any object.

In the Assessment Book: Try to answer: Self-Assessment (24)

Exercises on Lesson 2

Understand

Apply

· Analyze

Evaluate

Choose the correct answer:

1. All objects around us can move by the effect of

pushing force only.

b. pulling force only.

c. pushing and pulling forces.

d, sound and light energies.

2. A ball may move away from the foot of a football player by the effect of

a. pushing force only.

b. pulling force only.

c. pushing and pulling forces.

d. sound energy only.

3. By increasing the number of fire extinguishers fixed to a cart, its speed

a. increases.

b. decreases.

c. doesn't change,

d. becomes zero.

4. In the tug-of-war game, two teams

a. pull the rope in the same direction.

b. pull the rope in opposite directions.

c. push the rope in the same direction.

d. push the rope in opposite directions.

 5. In the tug-of-war game, when two teams are pulling a rope, and the rope does not move towards any team, this means that

a, equal forces are being applied on the rope in the same direction.

b. equal forces are being applied on the rope in opposite directions.

c. unequal forces are being applied on the rope in the same direction.

d. unequal forces are being applied on the rope in opposite directions.

a. Two persons push a box with the same force in opposite directions.

b. Two children play on a seasaw without its moving up or down.

c. Two children play on a seasaw, that moves up and down,

d. Two teams play the tug-of-war game while the rope doesn't move.

7. When an object is in motion, this means that its changes.

a. color

b. shape

C. Size

d. position

(Caute

a. a running person.

b, a ball travelling through the air.

c. a flying bird.

d. a sleeping dog.

, 9		the following objects except to	ne movement	
	Of		THE MINOR COMPANY	
	a. a flying airplane.	b. a running horse.		
,	c. sea waves.	d. the planet Earth,		
. 1	O. Gravity is a force that		(Kair El-Sheikh 20	วาเ
	a, pushes objects down toward	20	42)	
	b. pulls objects down toward ti			
	c. pushes objects toward the s			
	d. pulls objects toward the sky	,		
2 P	ut (//) or (X):			
• 1	. To open or close a door, we hav	•	()
• 2	When the air is released backw	ard from the fire extinguishers	fixed to a cart.	,
	the cart moves backward.		()
• 3	By decreasing the number of fir	e extinguishers fixed to a cart	the speed	,
	of the cart increases.		()
• 4	Using a remote control of a tele	vision needs a pushing force t	o act	,
	on its buttons.		()
• 5	. If the two teams in the tug-of-wa	ar game are pulling the rope w	ith equal forces,	Ĺ
	the rope will move towards one		()
• 6	. If one team in the tug-of-war ga	me pulls the rope with a great	er force,	
	the rope will move towards the	team with the smaller force.	()
• 7	The stopping object can't move	until a force acts on it.	(Minia 2022) ()
• 8	The rotation of Earth around the	e Sun is easy to be seen.	()
3 V	rite the scientific term of each	of the following :		
	The force you can do to move a		(.)
	The force you can do to bring a		()
	A change in the position of an o		()
	The force that pulls objects dow		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,)
4	Omplete the following sentence	ie i		
9 1	The wind can move small things	of a tree, so eng	ineers use this	
	idea in moving a cart by fixing	onto it.		
. 2	If we put more than one fire exti	nguisher to a cart, so the	of the car will	
	' " we put more than one tire exti	Highlight to the many		
	increase.			219

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Thur ? I (alejanen)

To the second control of the second control	,,,,,	
Look at the opposite figure, then answer the following		
questions :	7	h
1. In the opposite figure what happens if we increase the number of fire extinguishers fixed to the cart.		
2. Put (V) or (X):		
The air released by fire extinguishers moves backward, so the cart moves		
forward.		
2. When we decrease the number of fire extinguishers, the cart moves for	(
a longer distance.	,	
Write the type of force that is used in each of the following situations :	(
1		
2.		
1		
1		_

LESSON





▶ Look at each picture, then write if the acting force is "Push" or "Pull";









What makes objects move?

- From the previous examples, we can conclude that any object needs a force move and change its position.

Force:

It is a push or pull that is applied to an object causes it to change its position.

- ▶ What are the forces that affect the bag when you lift it?
 - · When you pull your bag up from the floor, the force of gravity pulls your bag down while your arm pulls it up.



- ▶ Is there any force affects us when we are not in motion ?
 - When you sit on a chair, the force of gravity is pulling you downward and holding you in the chair.



Check your understanding

Look at the following pictures, then complete the sentences below each picture by writing if the forces are "balanced" or "unbalanced" (If it is unbalanced draw an arrow that shows the direction of the rope motion):



Draw your arrow

Draw your arrow

Draw your arrow

Optional Digital Activ

Activity 7 "Tug-of-War" in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

Activity 8 Stopping Motion

In the opposite picture:

- The toy car on the table is being pulled down by gravity, and also pushed up by the force that the table exerts.
- When the forces on the toy car are balanced, it does not move.

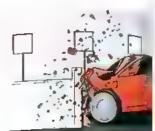


How does an object in motion stop?

A moving object only stops when a force of the same amount is applied to it in it opposite direction of its motion.

 Sometimes it is easy to observe where the force that stops an object comes from, such as :

A car crashes into a wall, it will stop because the wall applied a force to the car with the same amount of the force that pushes the car towards the wall.



Direction of friction of an

Direction of car movement

 Sometimes it is hard to observe where the force that stops an object comes from, such as :

A car runs out of fuel on a flat road, its speed decreases gradually until it stops.

Because there is a friction force comes from :

- 1. Friction (rub) between the car tires and the road.
- 2. Friction between the air that flows over the car against its surface.

Friction:

It is a force that is exerted when objects rub against each other.

Notes

- 1. Friction force always slows down or stops motion of moving objects.
- 2. The direction of friction force is always opposite to the direction of motion moving object.

exerts observe

runs out بيدل fuel يلاحظ gradually يمطيم

friction ينفذ / ينتهي tires الوفود dur تدریجیا



Check your understanding

Complete the following sentences using the words below: (friction - opposes - unbalanced)

- 1. Any object moves from its place when the forces acting on it are
- 2. The force that slows down or stops motion is called .
- 3. Friction is a force that motion.



Optional Digital Activity

Activity 19 "Launching a Satellite" in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

In the Assessment Book:
Try to answer:
Self-Assessment (25)

Exercises on Lesson 3

● Understand	Analyze Evaluate	• Cr
1 Choose the correct answer:		
1. When you sit on a chair, the force a. pulling you upward c. pushing you upward	e of gravity is and holding you downward d. pushing you downward	you in the c
 2. What force makes a ball in the a a. Friction. c. Sound. 	ir fall down to the ground ? b. Gravity. d. Light.	
 3. Which of the following will cause a. Balanced forces. c. Sound energy. 	e an object to move ? b. Unbalanced forces, d. Light energy.	(Lu _{XOr}
 4. Two equal forces act at the sam directions. Which sentence descar. a. The object speed increases. b. The object speed decreases. c. The object speed doesn't chard. The object stays in its place w 5. The force that tries to stop an object. 	cribes the object's motion? Inge. vithout moving.	
a. gravity. c. push.	b. friction. d. pull.	,
 6. There is a force between the its speed gradually. a. gravity c. pushing 	the car tires and the road that act b. friction d. pulling	ts to decrea (Dakahlia
 7. Which of the following sentence a. It pulls objects toward the group. b. It pushes objects away from the composition of stops objects. d. It doesn't affect objects in months. 	es describes the friction force? bund. the ground, s in motion,	
2 Put (✓) or (X):		
1. Unbalanced forces cause a cha	inge in the object position.	{
2. When a car crashes into a wall,	it will not stop.	(
 3. Sometimes it is easy to observe 4. When a car runs out of fue on a until it stops. 	a flat road, its speed increases gra	aduaily

	5. Friction force always slows down or stops the motion of moving objects.	,	
	5. Friction force and your destriction of moving objects. 6. Unbalanced forces keep an object in its place without moving.	()
0	Correct the underlined words: When you jump up, the force of friction pulls you back to the ground.		
3	When you jump up, the force of friction pulls you back to the ground. (,
•	The rope in the tug-of-war game may not move towards any team,		
	3. Moving objects stop when a force of the same amount is applied to		
	it in the same direction. 4. If a car runs out of fuel, its speed increases. (******	
	5. The motion of a car is opposed by the gravity of air. (*******)
	Write the scientific term of each of the following:	_	
1	1. It is a push or pull that is applied to an object causes it to change		
	its position. (Cairo 2022) (£ 0 ~ + 2 = 1.4 ·)
F	2. It is a force that is exerted when objects rub against each other. ()
	3. It is a force that slows down the motion of moving objects. (,)
5	Complete the following sentences :		
	1. As you are sitting down on a chair, there are two forces that act on your b which are the force of gravity and the force of the chair.	ody	
f	2. The toy placed on a table does not move due to the effect of the two forces acting on it.		
ę	3. When you lift up an object from the ground, there are two forces act on it, are the force of your hand and force of the gravity.	whic	h
•	4. The speed of a ball moving on the ground decreases gradually until it stop to the effect of force.	s du	le
e	5. When you throw a ball up in the air, it starts to fall down again towards the ground due to the effect of pulling force of		
	6. A moving car is affected by the force of both air and road which as the direction of the car movement.	et in	
6	Give reasons for :		
6	1. When your toy car crashes into a wall, it will stop moving.		
	The second resource and the second se		
	Then, the same and		
1	2. When you stop pedalling during the movement of your bloycle, it slows dow until it stops.	'n	
	the Company of the Co		
	** · · · · · · · · · · · · · · · · · ·		

- The second secon 1. You let your toy out of your hand.
- You kick a football.
- Look at the following pictures, then choose if the forces are "balanced" or "unbalanced":



1. A book on a table (Balanced - Unbalanced) (Balanced - Unbalanced)



2. A seesaw

Look at the following figure, then choose the correct answer:

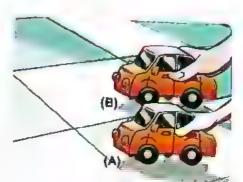


- 1. Among the forces that act on the basketball in this figure are
 - a. pushing force of both gravity and the player's hand.
 - b. pulling force of both gravity and the player's hand.
 - c. pushing force of gravity and pulling force of the player's hand.
 - d. pulling force of gravity and pushing force of the player's hand.
- 2. The basketball will fall down to the ground due to the that acts on it.
 - a. pushing force of gravity
- b. pulling force of gravity
- c. friction force of air
- d. friction force of ground



Activity 10 Rolling Cars

- Look at the opposite figure, then choose the correct answer:
 - If we roll the two cars with two different forces, where car (B) is pushed with a force greater than car (A).



'You have learned about the causes of motion, in this activity you will explore the effect of applying different amounts of force to an object.

Tools



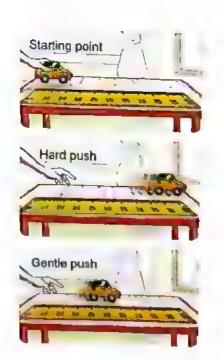
Toy car



Measuring ruler

Steps

- 1. Push a toy car hard from a starting point.
- Record the distance the toy car rolls by using the measuring ruler.
- Repeat step (1) and (2) several times, and record the data in a table, then find the average distance.
- 4. Push a toy car very gently from the same starting point.
- 5. Record the distance the toy car rolls.
- 6. Repeat step (4) and (5) several times, and record the data in another table, then find the average distance.



Observations

 The car moves a large distance when it is pushed hard as shown in the following table:

Ha	ard push
Trial	Distance (cm)
1	90 cm
2	75 cm
3	80 cm
4	95 cm
70 + 75 + 4	e distance = 80 + 95 = 85 cm

 The car moves a small distance when it is pushed gently as shown;
 the following table:

Gentle push	
Trial	Distance (cm)
1	14 cm
2	17 cm
3	20 cm
4	17 cm
The average 14 + 17 + 20	

4

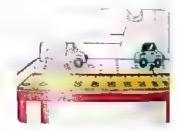
Conclusions

- Hard push causes object to travel a long distance.
- Gentle push causes object to travel a small distance.

Note

If the same force acts on a toy car and a toy truck :

- The car (the small object) will travel a farther distance.
- The truck (the bigger object) will travel a shorter distance.





Check your understanding

▶ Put (√) or (x):

- 1. A toy car travels a very small distance when it is pushed hard.
- 2. When we threw a bowling ball and a tennis ball in the air with the same force the bowling ball will move faster.

In the Assessment Book: Try to answer: Self-Assessment 26

Exercises on Lesson 4

Understand	© Apply	Analyze	• Evaluate	Create	
- 4	he correct answer ;			CIDGIG	
1 Choose II	auchoe a hall on a flat are				
1 Tames	pushes a sam on a nat git	ound and it cov	ers a distance of 30 cm.	If he	
	it with more force, it may b. 15	cover a distar	nce equal to cm.		
a. 5		c. 30	d. 50		
2. The for	ce that occurs when an o	bject rubs aga	inst another object is cal	led	
a. friction	on. D. gravity.	c. push.	d. pull, (A	finia 20	1221
. 3. Each o	f your father and your you	ing brother tak	e turns to push you have		
swing,	the hand pushing force o	f your father w	ill be that of your bu	other	G
a. less	than.	b. the same	e as.	Ou ICI.	
c. more	than.	d. weaker t	han,		
. 4. When v	we throw a ball into the ai	r, it falls down	ward. During its falling it i	c	
affecte	d by two forces which are		_	3	
a. friction	on of air and gravity push	b. gravity p	oush and your pull		
c. your	push and gravity pull.	d. friction o	f air and gravity pull.		
Put (V) o					
• 1. The mo	otion of an object on the g	round is affect	ted by a friction force.	(}
· 2. Hard p	ush causes an object to t	ravel for a long	ger distance.	()
traval 6	ame force acts on two dif	ferent objects	so, the bigger object will		
	or a longer distance.			()
etone #	all rolls on the ground to	a distance the	n it stops. The force whic	h	
210h2 [he ball is the gravitationa	force.		()
3 Complete	e the following sentence				_
1. When	you kick a ball hard, it wil	l move for a	distance But who	n vou	
KICK THE	e same ball gently, it will i	move for a	distance.		
2. We car	n say that a train is faster	than a car if th	neacting on the t	rain is	
*********	 inan that acting on the 	car to move the	e same distance.		
3. If you p	oush each of a small ball	and a big ball [,]	with the same force, the s	imall t	all
oA62	a distance than	the big ball.			
To in tug~(of-war game, the rope me	oves toward the	e group which has pulling	force	
5. If the -	than the other group.	the bound of	different sizes the smalle	r hav	
Will mo	than the other group. came pulling force acts or ove for a distance	I TWO DOXES OF	umarant sizas, trio sifiant	UUX	

b. the friction force of the air.

d. the pushing gravity force.

a, the pushing force.

c. the friction force of the floor,



Activity 111 Energy, Work and Force

, Look at the opposite picture, then choose the correct answer:

The car moves when a force acts on it. (pushing - pulling)



The relationship between energy, work and force:

- To make an object start or stop moving, this requires a force (either a push or a pull).
- . Applying this force to the object requires energy.
- The following example shows the relationship between energy, work and force:
- -Imagine you had to push a car along a flat road so, this needs a lot of force.
- . When you push the car, the energy transfers from your body to the car due to the force that your body exerts on the car.



- When you move the car, you are doing work.
- From the previous example, we can conclude that:
- Force transfers energy from one object to another.
- The work done is equal to time amount of energy transferred by a force that is used to move an object.

Force Enables us to do Work **Transfers** Energy

Note

Force and energy are different, but they are related to one another, where force is the effect that changes energy and turns it into work.

Check your understanding

Complete the following sentences using the words below:

(force - work)

- 1. To make an object start or stop moving, this requires
- 2. When you push a car and it starts to move, you are doing

qirtanoifsign energy WORK:

requires صلة flat road طاقة transfers شغل

enables us يحتاج related to طريق مسطح ينتقل / يتحون

متعلق ب

233

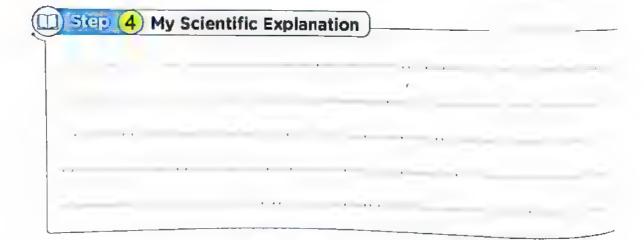
Activity 12 Record Evidence Like A Scientist

- In this concept, you have learned a lot about the role of balanced and unbalance forces in starting and stopping motion.
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the foresteps you have learned in the previous concepts.

Pow do forces act on different objects to make them start moving and stop moving?







Activity 13 Review Starting and Stopping

We can summarize this concept in the following main points:

- The shockwave truck has been fitted with three jet engines, so that it is about five
- , To stop the shockwave truck, the engineers installed three parachutes that the driver opens to help slow down the truck quickly.
- , There are two forces that cause objects to move which are :
 - Pushing force.

- Pulling force.
- . Air can move objects such as leaves on a tree that move by the wind blowing.
- . When some engineers fix fire extinguishers onto a cart, then release air from the fire extinguishers, the air moves backword that makes the cart begines to move forward.
- If balanced forces act on an object, it will not move.
- If unbalanced forces act on an object, it will move towards the greater force.

Motion:

It is any change in the position of an object relative to a fixed point.

Gravity:

It is the force that pulls objects down toward the Earth.

- Some motion is easy to see such as a person walking down the street.
- Some motion is hard to see such as the rotation of Earth around the Sun.

Force:

It is a push or pull that is applied to an object causes it to change its position.

* Moving object only stops when a force of the same amount is applied to it in the opposite direction of its motion.

Friction:

It is a force that is exerted when objects rub against each other.

- *Friction force always slows down or stops motion of moving objects.
- *The direction of friction force is always opposite to the direction of motion of a moving object.

- Hard push causes object to travel a long distance.
- Gentle push causes object to travel a small distance.
- If the same force acts on a toy car and a toy truck :
 - The car (the small object) will travel a farther distance.
- The truck (the bigger object) will travel a shorter distance.
- Force transfers energy from one object to another.
- The work done is equal to the amount of energy transferred by a force that is us to move an object.



In the Assessment Book:

Try to answer:

Self-Assessment 27

Model Exam on Concept (2)

Exercises on Lesson 5

hand	O Apply				
Understand		● Analyze	• Evaluate	● Create	
choose the c	correct answer :				
All of the fo	llowing examples	can move by a push			
a. a ball.		h a stute o	ling force except	*144******	
c. tug-of-wa	ar rope.	b. a swing. d. a car.			
		an apply a aga			
a pushing	force b. gravity for	rce c second	ainst it.		
a. paring	ned his toy car that	rce c. sound ener	rgy d. light energ	ду	
a. pusit it it	THE SAME MOVING	t moved forward, to		******	
b. pull it wit	in a small force in	the same moving di	rection.		
c. pull it wit	in a large force in t	the same moving dir	ection		
d. push it ir	n a direction oppos	site to its moving dire	ection		
4. The work d	lone is equal to the ove an object.	e amount of tra	ansferred by a for	ce that is	
a. energy	b. friction	c, pushing	d. gravity		
2 Put (√) or (X)):				
• 1. If a person	moves a table thre	ough a distance, the	re is a work done	e. (١
• 2. Lifting a bo	ok upward needs	more energy than p	ushing a truck.	(í
• 3. If you try to	open a door but y	ou cannot open it, t	his means that w	ork	1
is done.	•	, , , , , , , , , , , , , , , , , , , ,	THE THOUSE WILL W	()
• 4. Hitting a te	nnis ball needs a ;	pulling force.		ì	í
	e following 😳 😘				
body to the		ove on the floor, the	transfers	from your	
	applied to an object intodone	et is considered as the	ne effect that cha	nges	
• 3. The work d	lone on a basketba	all is equal to the an	nount of t	ransferred	
	ayer hand to the b		o ovort a force	than	
	rolling ball on the xerted by the ball.	ground, you need to	y exert a loice		
In the oppos	ite figure, which o	of the two players d	oes 50 kg	70 kg	-
more work to	raise the weight	s ?			
(Give a reaso	n for your answer	·).			
**************		********************************			
*************		*			

237

Model Exam on Concept (2.1)

Understand

OAsply

Analyze

Evaluate

(A) Choose the correct answer:

1. Mona throws her ball up in the air so, gravity will make the ball move

- - a. forward.

b. upward.

c. downward.

d. backward.

- 2. Which situation represents the best example of gravity?
 - a. A car hits a tree and its motion stops.
 - b. A wind blows and a sailboat moves.
 - c. A book is pushed to move across a table.
 - A person drops a ball that falls to the ground.
- 3. The speed of the Shockwave truck is more than that of the
 - a. normal truck only.
 - b. jet airplane only.
 - c. normal truck and rocket.
 - d. normal truck and jet airplane.
- 4. All the following are examples of pushing force except
 - a. writing using a keyboard.

b. lifting a bag.

c. kicking a ball.

d. throwing a basketball.

(B) What happens if ...?

The forces that are acting on the rope of tug-of-war game are balanced? (according to the movement of the rope)

2 (A) Put (V) or (X):

- Gravity pulls objects upward.
- 2. The main difference between pulling and pushing forces is the direction of the force.
- 3. We can't observe the movement of a person walking on the street.
- 4. If you move a chair through a distance, there is work done.
- (B) Give a reason for the following:

If you push a pen on the table, it moves for a certain distance till it stops.

(A) Complete the following sentences	•
MUSIL Me has a les and und und undulis	II truck, its speed will
o The picycle carriot move without a	acting on 4
When you push a toy car on the grou	Ind. its speed doses-
4. To stop a moving toy truck on the gro than that exerted by the toy truck.	
(B) Classify the following actions in the	table below according to the needed force:
1. Typing on a keyboard.	2. Litting a bag.
3. Moving a chair away from you.	4. Kicking a football
5. Closing your room's door from inside	the room.
6. Opening the door of a refregirator.	
Pulling force	Pushing force
, manufallableseresseed vertileteles had state-to-to-to-to-to-to-to-to-to-to-to-to-to-	44
((COLUMN TO THE COLUMN TO THE A STREET THE PARTY OF THE	***************************************

**************************************	***************************************
(A) Correct the underlined 🙉 🖖 ;	
By increasing the pushing force acting for a short distance.	
for a short distance.	()
2. Any moving object stops when a force	
applied on it in the same direction of i	
3. To increase the speed of Shockwave	truck, engineers installed
three parachutes in it.	ı
4. A table stays without any motion due that are acting on it.	to the unbalanced loices
	,
(B) Look at the opposite figure, then co	
1. The person in this figure use to	
2. The idea of person landing in this figu	
the idea of stopping the motion of	SI)U mon

Concept 2.2

Energy and Motion



Learning outcomes

By the end of this concept, your child will be able to:

- Investigate the forms of energy in a system or for an object.
- Apply logical reasoning to predict the types of energy for an object.
- Cite evidence to explain how energy is conserved.

Key vocabulary

- Kinetic energy
- Potential energy
- Chemical energy
- Gravitational potential energy
- Thermal energy

Notes For Parents On Concept [2,2]

Lessons	Activities	What you should do with your child
	Activity 1	Let your child mention some examples of objects that have kinetic energy an
1	Activity 2	potential energy. Discuss with your child the different types of energy in the roller coaster during its movement.
	Activity 3	Optional digital activity.
	Activity 4	Discuss with your child the different forms of energy and let him/her mention some examples of each of them.
2	Activity 5	Explain to your child the relationship between energy and work.
	Activity 6	Explain to your child the meaning of "potential energy" and "kinetic energy".
	Activity 6	Explain to your child the meaning of "force" and its effect in our daily life.
Activity 7 groups which are p	- Explain to your child that all forms of energy are classified into two main groups which are potential energy and kinetic energy - Discuss with your child that potential energy depended on the mass of an eligand its height from the Earth's surface.	
	Activity 6	Let your child mention the changes of energy in some devices.
	Activity 9	Optional digital activity.
_	Activity 10	Optional digital activity.
4	Activity 11	Explain to your child the concept of ; "energy is not created or destroyed".
	Activity 12 Help your child to think like a scientist to the main points of this concept, then we explanation.	Help your child to think like a scientist by answering a question about one of the main points of this concept, then write his/her claim, evidence and scientific explanation.
5	Activity 13	Optional digital activity.
	Activity 14	Let your child review the main points in this concept.



In the previous concept, you have learnt that:

Objects need a force to move or stop and this force on objects needs energy to be able to do work, so how do moving objects get energy?

- In figure ①, A sand surfer moves very fast down the sand hill.
- In figure 2, The ball moves through the air when the player kicks it with his foot.
- In figure 3, The toy car at the top of slope will not move if no force is applied on it.

From the previous observations, we can conclude that:

- -All moving objects have a type of energy known as kinetic energy.
- -Objects that do not move don't have kinetic energy but they have another type of energy known as potential energy that is stored inside them, when these objects start to move, they get kinetic energy.

In this concept, we will study:

- The meaning of energy and its basics.
- Types of energy.
- *Kinetic energy and potential energy.
- *Energy transformation in engines.

skiing

force التزحلق

energy تل

kinetic energy all potential energy transformation مُنزيج على الرمال sand surfer منحدر

engines طاقة جركة طافة وضع

تحول

محركات

Activity 2 Roller Coasters

In your opinion, which of the following energies are responsible for the movement of the roller coaster (train) ?

- a. Kinetic energy and light energy.
- b. Potential energy and sound energy.
- c. Electric energy and kinetic energy.
- d. Sound energy and thermal energy.

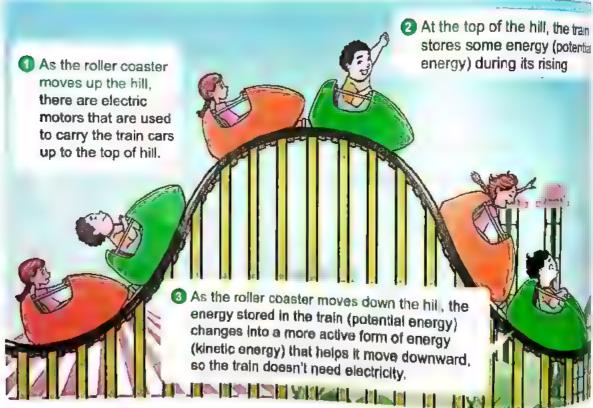


Roller coaster

How does the roller coaster move and what is the source of its kinetic energy?

The roller coaster moves up rapidly, then its speed decreases gradually until it reaches the highest point, then it pauses briefly at the top of the hill (ramp), then the speed of the train will increase as it moves down the hill.

► To know the source of energy that makes the train move with this speed read the following steps:



? Note

While the roller coaster moves down the hill, the kinetic energy increases as its speed increases.

From the previous explanation, we can conclude that :

- . When the roller coaster moves downward, its kinetic energy increases.
- The kinetic energy increases as the speed increases.

What happens If ... 🤊

- A roller coaster moves from up to down. (according to its energy). The stored potential energy in the train is changed into kinetic energy.
- A roller coaster stops. (according to its kinetic energy). Its kinetic energy becomes zero.



Check your understanding

▶ Put (√) or (x):

1.	Kinetic energy of a moving object increases as its speed increases.	(۱
2.	When a roller coaster moves from up to down, it has the most kinetic	`	,
	energy when it reaches the lowest point of the hill.	()
3.	When the roller coaster moves downward, its kinetic energy decreases	,	í

Optional Digital Activity

Activity . " Energy in the Classroom " in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

In the Assessment Book:

Try to answer: Self-Assessment (28)

Exercises on Lesson 1

Understand

Apply

Analyze

Evaluate

O Cres

1	Choose	the	corract	answer	

• 1. When a sand surfer moves down the hill, this means that he hasdue

his movement. a. kinetic energy

b. stored light energy

c. potential energy

d. stored electric energy

- 2. The speed of the roller coaster when it goes up,
 - a. is equal to its speed when it goes down.
 - b. is less than its speed when it goes down.
 - c. is more than its speed when it goes down.
 - d. increases as it reaches the top of the hill.
- 3. When wheelchair and a car go up a ramp, which of them can store some energy?.....
 - The wheelchair only.

b. The car only.

c. Both of them,

d. None of them.

- 4. Electric motor in the roller coaster helps it to
 - a. move up to the top of the hill.
 - b. move down to the bottom of the hill.
 - c. stop at the top of the hill.
 - d. stop at the bottom of the hill,
- 5. When an object moves down a ramp, its stored potential energy
 - a. increases.

b. doesn't change.

- c. changes to a less active form of energy.
- d. changes to a more active form of energy,

(Assul-

- - a. as it goes up to the top of the hill.
 - b, as it goes down the hill,
 - c. when it stops at the top of the hill.
 - d. when it stops at the bottom of the hill,
- 7. When the roller coaster stops, its energy of motion
 - a. doesn't change.

b. increases,

c. decreases.

- d. becomes zero.
- 8. When a car moves up a ramp, this happens due to the effect of
 - a. gravity force.

b. balanced force.

c. kinetic energy.

d. sound energy.

Choose from column (B) what suits it in column (A):

(A)	(B)	
1. When a wheelchair goes	a. it is under the effect of balanced a	0,000
down a ramp,	doesn't store energy.	orce, and
2. When a wheelchair stops	b. it has only energy of motion.	
at the top of a ramp,	c. it is under the effect of unbeller	d force, where
at the bottom of a ramp,	d. it is under the effect of balanced f stores energy.	orce, and it
1	2 3	
Put (✓) or (X) :		
	affected by two opposite equal forces i	t will not move
		(
2. If a wheelchair moves hor	zontally on the ground, its energy of r	notion
equals zero.		(
3. The moving objects only h	ave energy, while the objects that dor	n't move
have no energy.		(Giza 2022) (
Write the scientific term of	the following :	
	e object has due to its movement.	
		()
increases,	creases when the speed of an object (Sohag 20	022) ()
Correct the underlined wor	ds:	
1. When a roller coaster mov	es down a ramp, its kinetic energy	
uoesn't change.		()
2. If you push a pencil upwa	rd, it stops at a certain height then falls	down
que to the effect of pushing	g force of gravity.	(
3. When an object moves do	wn, it has more active form of energy	
"""WIN as potential energy	1	()
to the ground	g force of gravity, anything falls down	()
5. Balanced forces cause sto	opped objects to move.	(
		24

Understand

 2. The speed of a roller coaster when than that when it moves down the speed of an object decrease. 3. If the speed of an object decrease. 4. When the roller coaster moves up energies cause its motion. 	move, it gets energy ward in a move and in a

 2. The speed of the roller coaster in 	creases as it moves down the hill.
	* * * ****** ******** ** ***** ****** *
What happens if ?	
1. Roller coaster moves down the hi	ill. (according to the change of energ
***************************************	PRINT THE STATE CONTRACT CONTR
2. The roller coaster loses its kinetic	eneray.
	np starts to move down. (according to its energ
Section 1	choose the correct answer.
1. The speed of the car increases w	hen it
a. stops at point (A).	(110) IL ,
	ite.
b. moves from (A) to (B).	
c. stops at point (C).	C. C.
d. moves from (B) to (C).	Di II
The speed of the car decreases to	when
 a. it moves from (A) to (B). 	b. its kinetic energy doesn't change.
C. It's Killotic cite. By morazon.	it moves from (H) to (C)
3. The kinetic energy of the car Incr	eases in all the following cases except when
the car	cases except when
a, moves from (A) to (B).	b. moves from (C) to (D).
a moves from (B) to (C)	d. speed increase.

d. speed increases.

c. moves from (B) to (C).

Activity 4

What Do You Already Know About Energy and Motion?

, Observe these pictures, then put (/) in front of the objects that have energy.







From the previous pictures, you can observe that we need energy to do all our daily activities such as running, walking and even during reading a book.

\$0, energy is part of everything that happens in the world and everything we do.

PExamples show the importance of energy in our life:

We eat food to obtain energy to help us grow and move.



Energy affects objects and makes them move and change their places.



3 Energy helps in operating all electric devices.



⁴ Energy helps in cooking.



Moving Energy:

• Energy moves (transfers) from an object to another as in the example being that shows that shows a player kicks a ball as shown in the following steps :

The kinetic energy transfers from the player's foot to the ball when he kicks it.



Then, the ball moves in the air as a result of the transfer of kinetic energy to it.



Then, the kinetic energy transfers from the ball to the goal net which vibrates as a result of the transfer of kinetic energy to it.



Note

Any stopped object on the Earth's surface as in figure (1) has no energy, while any object at a height from the Earth's surface as in figure (2) has a special type of energy known as potential energy.



Figure (1)

Figure (2)

Check your undermanding

- ▶ Put (√) or (×):
 - 1. Energy affects objects and makes them move and change their places.
 - 2. Energy doesn't transfer from an object to another.

Activity 5 Energy Basics

rem the previous concept, you have learned that there is a relation between energy, force and work, where:

Force is something that changes energy to make it able to do work.

, so, we can define energy and work as follows:

Energy:

It is the ability to do work or cause

change.

Work:

It is a force that causes an object to move a distance,

rexample to show the relation between energy and work :

- When a football player kicks a ball, the force of his kick causes the ball move in a different direction.
- . Thus the player does work and he consumes energy (that he had obtained from food) to move his leg.
- . So, the work done by this player causes the ball to move.



Facts about energy:

Energy can be stored and changed from one form into another.

Example:

When you hold a ball, it stores rential energy, when you let it falls down to the ground, the ball is moving where the potential energy stored in it is changed into kinetic energy.



² Most forms of energy can't be seen.

Example:

Sound energy, thermal energy, electrical energy and chemical energy are forms of energy that can't be seen.



We can see and measure what energy can do.

When you push a wooden box and this box moves, this means that the energy transfers from you to the box and also can be measured through the distance that the box moves.





Check your understanding

- Complete the following sentences:
 - 1. The ability to do work is known as ..
 - 2. The force that causes an object to move a distance is known as ...
- ▶ Put (√) or (x):
 - 1. Energy doesn't change from one form into another form.
 - 2. When you push a wall and this wall doesn't move, this means that you does work.
 - 3. The person who pushes a car forward and this car moves, this means that the person consumes energy.

Activity 6 Kinetic and Potential Energy

, scientists classify energy into two types which are :

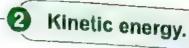
Potential energy

It is the amount of energy that is stored in an object due to its position.



Example:

The ball has potential energy stored in it when you lift it up away from the Earth's surface.



It is the energy of an object due to its motion.

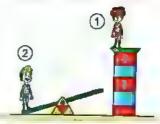


Example:

The ball has a kinetic energy when you let it fall down to the ground.

Now, let's see an example to find out how the potential energy can be changed into kinetic energy.

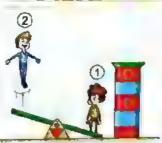
1 Acrobat 1 on the tower has potential energy.



When he jumped down, his potential energy is converted into kinetic energy.



The kinetic energy of acrobat 1 transfers to acrobat 2 who is standing on the seesaw and causes him to be pushed up into the air.



During the movement of acrobat 2 up in the air, his kinetic energy is converted gradually into potential energy.



₽ Notes

- 1. When an object has potential energy, so this object is ready to do work or to be
- 2. As the height of an object from the Earth's surface increases, potential energy stored inside this object increases.



Complete the following sentences:

- energy and 1. Scientists classify energy into two types which are energy.
- energy stored in it when you lift it up away from the 2. The object has Earth's surface.
- by increasing the height of the object from the Earth 3. Potential energy surface.

In the Assessment 800 Try to answer: Self-Assessment (29)

Exercises on Lesson 2

The same of the sa	Apply	
Linderstand		● Analyze
OL INC.		Evaluata
Achoose the	correct answer ;	• Create
a light end	nergy	om one place to another. b. energy obtained from food d. energy obtained from batteries
c. gravity f	orce	b. pulling force
a. smaller c. smaller	kinetic energy	ters high from the Earth's surface has
b. its poter c. its poter d. its kineti	itial energy changes int itial energy remains as c energy remains as it i	left to fall down, ootential energy. o kinetic energy. it is.
• 5. The form e	nergy that can be seen	is energy.

c. electric d. chemical The following table shows Sasty is different situations. Choose from column (B) * the type and the amount of energy that suits each situation in column (A):

c. light

d. sound

(Alexandria 2022)

a. thermal

energy.

a. kinetic

b. electric

b. potentiai

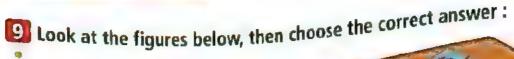
(A)	(B)
Samy stops at 20 meter	a. he has a stored electrical energy.
Samy stops at 5 meter	b. he does not have potential or kinetic energies
Samy stops on the	c. he has a large amount of kinetic energy.
	d. he has a small amount of potential energy.
Samy walks slowly on the Earth's surface	e. he has a small amount of kinetic energy.
Samy runs fast on the Earth's surface	f, he has a large amount of potential energy.

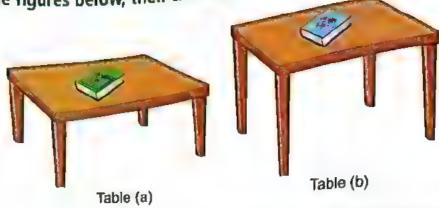
2.

3 Put (✓) or (X):	
B 4 this is a second to the company	
2. Energy doesn't transfer from an object to another.	ју. ,
 2. Energy doesn't transfer from an object to and 3. Any moving object has a form of energy known as kinetic energy 4. When an object is left to fall down to the Earth's surface, its portant 	tential energ
is changed into kinetic energy. • 5. We can measure the distance that an object moved as a result	of pushing
force.	ice.
7. As the height of an object from the Earth's surface (5) Apperox decreases	Sharkia 2022
8. When an object moves faster, it gains a larger amount of kinet	c energy.
Write the scientific term of each of the following:	
 1. The energy that is stored in an object due to its position at a ce 	rtain
height from the Earth's surface.	2022) (
• 2. The energy that the object gains due to its motion.	2022) (
	2022) (
 4. The force that makes an object to move over a distance. 	(.
5. The energy that is changed into kinetic energy when an object	
falls down to the Earth's surface.	of the tra
Correct the underlined words:	
Your <u>potential</u> energy is transferred from your foot to a ball when you kick it.	(xeres
2. The ability to do force or cause change is known as energy.	(
3. We cannot see all forms of energy, except thermal energy.	(,
4. As the object moves faster, its potential energy increases.	(
5. The energy form stored in a stopped wooden box placed on	
a table is kinetic energy.	(

relete the following sentences :	
Complete the following sentences: 1. If you have the ability to push a chair, se force moves a ball moves over	o you have
1. If your a force moves a ball moves over 2. When a force moves a ball moves over done.	a distance we can say that is
3. When you kick a ball, the energ	
When an apple falls from a tree, its	energy will decrease.
types of energy can't be seen such as	h as energy, while some other
6. If an object is placed at a height above energy.	
7. If a bird flies from the ground up to a high	tree, its potential energy will
8. If you move a bag placed on a table to t	he floor, its potential energy will
7 Give reasons for :	
 1. The goal net vibrates when a ball hits it. 	
2. A bird stops on a tree has energy.	

6.2 Man	
1 3. When a stone is thrown upwards, its pot	ential energy increases.
	* *************************************
What happens if ?	
1. An object is placed at a height from the	Earth's surface.
	(according to its potential energy).
** ****** ****** **********************	,
² , An apple falls from a tree to the ground.	(according to the change in its energy).
3. You transfer a book from a lower shelf to	a higher shelf.
a pook italii si ibmei zuen m	(according to its potential energy).
Line de de la companya de la company	





- 1. According to the potential energy, which of the following statements is correct?
 - a. The two books have the same potential energy,
 - b. The book on table (a) has more potential energy.
 - c. The book on table (b) has more potential energy.
 - d. The two books have no potential energy.
- 2. If you transfer the book on table (a) onto table (b), its potential energy will
 - a. increase.
- b. decrease.
- c. not change.
- d be zero.

10 Look at the two opposite figures, then choose the correct answer:

- 1. In figure (a), the acrobat (1) has
 - a. potential energy more than that of acrobat (2).
 - b. potential energy less than that of acrobat (2).
 - c. potential energy similar to that of acrobat (2).
 - d. no potential energy like acrobat (2).

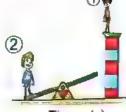


Figure (a)

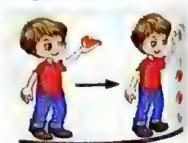
- 2. In figure (b), during the rising up of the acrobat (2) into the air, his
 - a. potential energy decreases.
 - b. potential energy increases.
 - c. potential and kinetic energies increase.
 - d. potential and kinetic energies decrease.



Figure (b)

10 Look at the opposite figure, then complete the following sentences:

- 1. When the boy lets the ball fall down, the energy which is stored in the ball changes into energy.
 - 2. When the ball hits the floor and bounces up, its energy will increase as it rises up.





Activity 7

Forms of Potential and Kinetic Energy

complete the sentences below each picture by writing potential or

kinetic.



1. The ball has

energy.



2. The moving bike has

energy.

Forms of potential energy

Gravitational potential energy



The stored energy in a roller coaster at the top of a hill



Chemical potential energy



The stored energy in batteries.



Photes

- 1. The chemical energy in the battery is not used until this battery is connected to a device.
- 2 When a spring is compressed, it stores Potential energy inside it.



Battery



Spring

spring الجاذبية compress متصلة



Factors affecting potential energy of an object:

Mass

By increasing the mass, the potential energy increases.

Example:

Ball 1 that has mass of 500 gram has a greater potential energy than ball (2) that has mass of 40 gram.



Height

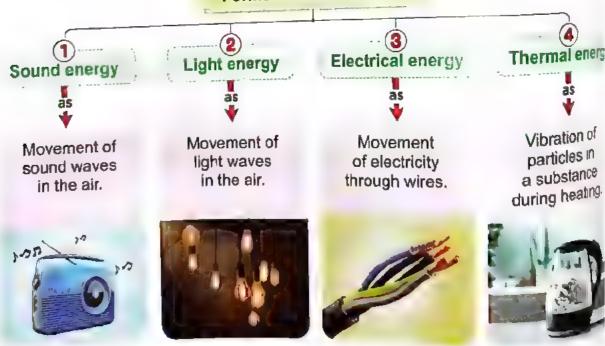
By increasing the height from the Earth's surface, the potential energy increases.

Example:

Ball 1 at height 1 metre has a greater potential energy than ball 2 at height $\frac{1}{2}$ metre.



Forms of kinetic energy



the previous lessons, you have known that energy is transformed another form such as a sily from one form into another form such as From the Pasily from one form into another form such as:

Changing of potential energy into kinetic energy.

Example 1 :

.Achild at the top of a playground slide has potential energy.

When the child moves down along the slide, the potential energy changes into kinetic energy.



Example 2 :

. When the roller coaster is at the top of the hill, it stores potential energy.

. When it goes down the hill, its potential energy changes into kinetic energy.



Check your under

Plookat the opposite pict en complete the sentences using these words:

(gravity - kinetic - potential)

- 1. The force that pulls the egg to the ground is
- 2. The egg has energy as it falls down.
- 3. The egg got energy when it was in the boy's hand,



Activity 8 Types of Energy

- Energy is found everywhere around us.
- Energy is continuously changing and transforming from one form into another form
- Energy is transferred from one place to another (such as when you kick a ball, energy moves from your leg to the ball).

Some changes of potential energy into kinetic energy.

		Energy changes	
Example	Source of energy	From	Into
Flashlight	Batteries	Chemical energy	Light energy and thermal energy,
Gas oven	Natural gas	Chemical energy	Thermal energy
Spring-powered car toy	Spring wire	Potential energy	Kinetic energy, sound energy and thermal energy.
Normal car	Gasoline	Chemical energy	Kinetic energy.

- ▶ From the previous explanation, we can conclude that :
- Energy can be stored in many different forms.
- New energy cannot be created and also existing energy cannot be destroyed.

0 Note

the food you eat also stores chemical energy, where your digestive system breaks down the food you eat and ohanges it into energy stored in your body,





Check your understanding

Complete the following table :

Example	Energy changes		Energy changes
	From	Into	
1. Electric fan :			
2. Door bell :			
3. Radio :			
4. Electric lamp :			

Optional Digital Activity

Activity 9 "Forms of Energy", in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

Optional Digital Activity

door bell الجهاز الهضمي

Activity 10 "Energy Transformation in Engines", in the school book is an optional digital activity. You can do this activity by scanning its QR code found in your school book.

> In the Assessment Book: Try to answer: Self-Assessment (30)

Exercises on Lesson 3

Understand

@ Apply

· Analyze

Evaluate

O Creat

Choose the correct answer:

- 1. A ball at the top of a hill stores energy.

d. potential

- c. chemical

- 2. The stored energy in a battery of a flashlight changes into, when it is turned on.
 - a. chemical energy

b. sound energy

c. light energy

- d. potential energy
- 3. All the following examples store chemical energy, except
 - a. food.
- b. natural gas.
- c. a battery.
- d. a compressed sprin
- 4. Energy can do all the following, except
 - a. It can be stored in an object.
 - b. It can be transferred from an object to another one.
 - c. It can be transformed from one form into another one.
 - d. It can be destroyed and cannot be created.
 - 5. If an object stops at a certain height from the Earth's surface for two hours to falls down, this means that
 - a. its potential energy will be destroyed before two hours.
 - b. its kinetic energy will be destroyed after two hours.
 - c. its stored potential energy will change into kinetic energy.
 - d. its stored kinetic energy will change into potential energy.
- 6. All the following examples have stored potential energy, except
 - a. a stopped roller coaster at the top of a hill.
 - a moving car on a flat road.
 - c. a battery of a car.
 - d. a compressed spring of a toy.
- 7. All the following examples represent kinetic energy, except
 - a. light waves moving through the air,
 - b. sound waves moving through the air.
 - c. stored chemical energy in a car battery.
 - d. water particles movement during heating.
- 8. The potential energy of an object depends on

(Cano?

- a. its mass only.
- b. its height from the Earth's surface only,
- c. its mass and its height from the Earth's surface,
- d. its temperature.

265

d, magnetic energy and			
from column (B)	what suits it in column (A):	airo 2	022
	That saits it in column (A):		
(A)	(B)		
Sound energy	a. changes into another energy that can be sto inside the human body.	ored	
Light energy			
3. Thermal energy	b. when it reaches our ears, it causes hearing	•	
Stored chemical energy in food	 c. changes into electrical energy in a flashlight d. is produced from electric heater. 	<u>.</u>	
5. Stored chemical	e. when it reaches the nose, it causes smelling		
energy in a battery	f. when it reaches our eyes, it causes vision.	J .	
	The same of the sa		
1	3	144444	
Put (//) or (X) :			
	e create in our existing energy can be destroyed.		
Acompressed spring s	stores a Mential energy.	(
	same masses and placed at the same height,	(
have the same potenti	ial energy		
	be transformed into potential energy.	(
Light waves is a form	of notantial as asset	(
We can see the mayo	or potential energy.	()
You can share the move	ment of electricity through a wire.	()
	ic energy into stored potential energy when you		
Compress a toy saving	1.	()
Tompless a toy spring			
Tompless a toy spring	pject from the Earth's surface increases, its potentia	d	

•	3 1 1 1 -	
1	of it is a form of kings.	
1	3. It is a form of kinetic energy due to vibrations of particles in a substance as it heats up. 4. It is a few.	
	a substance as it has	
•	4 It is a to the second of the	*****
ŗ	4. It is a form of potential annual to be blocks towards the Earth.	-14.

4. It is a form of potential energy that pulls objects towards the Earth's surface

Correct the underlined words:

- 1. When an object falls from a certain height, its stored potential energy changes into chemical energy.
- 2. The energy that is resulted due to the vibration of particles in a substance as it heats up, known as sound energy.
- 3. As the height of an object from the Earth's surface, decreases its potential energy increases.
- 4. Thermal, chemical, electrical and light energies are forms of kinetic energy.
- 5. A car battery stores a form of kinetic energy known as chemical energy.
- 6. A fan turns the chemical energy stored in natural gas into thermal energy, (Alexandria 2022) (......

6 Complete the following sentences:

- 1. Among the forms of potential energy and energies, while energy is a form of kinetic energy.
- 2. The energy which is stored in a ball at the top of a hill is ... potential
 3. Thermal energy.
- 3. Thermal energy is considered as one of the forms of energy.
- 4. Some forms of kinetic energy travel in air in the form of waves such as and energies.
- 5. Electrical energy is changed in loudspeakers into ... energy, while
 it is changed in the electric fan into energy.
- 6. In the electric bell, energy changes into energy.
- 7. The chemical energy in the battery of a flashlight can be changed into
 and energies.
- 8. In gas oven, energy changes into energy.
- 9. When a ball is on a table, it stores energy, while as it falls down to the ground, this energy changes into energy.

•	 When you clap your hands, the kir while when you rub your hands to energy. 	netic energy changes into energy, gether, kinetic energy changes into
0		energies which are considered as forms
•	12. Television needs energy and energies which are for	to be operated and changes it into orms of kinetic energy.
7	Give reasons for :	
*	1. Electric lamp produces different for	ms of energy.
•	2. On filling the spring of a toy car, the	en let it free, the car moves.
8	What happens if ?	
:	1. You operate a washing machine.	(according to the change of energy).
	2. A boy moves down the slide.	(according to the change of energy).
	3. You switch on an electric lamp.	(according to the change of energy).
9	Cross out the odd word	
	1. Sound energy - Light energy - The	ermal energy – Chemical energy. ()
	2. Sound energy – Light energy – Els	ectrical energy - Thermal energy. ()
10	Look at the opposite figure, then ch	noose the correct answer :
- (1. Mazen has a big amount of	Mazen
	a. potential energy.	b. kinetic energy.
	 c. both potential and kinetic energing 	ies.
	d. both potential and light energies	
	2. Which of the following sentences is	
	a. Amir has kinetic energy more th	
	b. Amir has potential energy more	than that of Mazen.
	c. Amir has kinetic energy equal to	to that of Mazen
	d. Amir has potential energy equal	Amir
	3. The potential energy of the ball is	b. equal to the kinetic energy of
	a. more than that of	d. less than that of
	c, equal to that of	and the second parameter and the second seco





- You have learned a lot about different forms of energy and how they can transform from one form into another.
- Now, you can use this knowledge to design a tool that helps us to do work.

Example:

- My tool : A robot hand
- · Its function: Opening the jar cap that it is hard to be opened.
- The source of energy: The robot gets power from batteries when it is turned on.



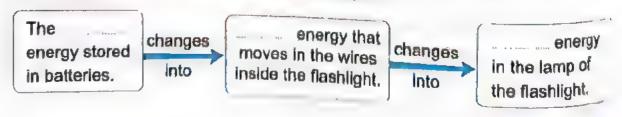
The changes of forms of energy inside the robot

Mechanical kinetic energy The chemical Electrical changes changes energy stored when the robot hand energy in the into into in the batteries. robot hand. moves to open the jar.

- From the previous explanation, we can conclude that :
 - Energy is not created or destroyed when transferred from the battery to the robot hand.
 - Energy is converted from one form (chemical energy) to another form of energy (mechanical energy) when the robot hand opens the jar.



▶ Complete the following diagram that shows the changes of energy when you switch on a flashlight:



in the Assessment Book Try to Answer: Self-Assessment (31)

easy life too! design

jar cap أدة لحياة أسهل robot rebot

shisted convert إنبينان آلي

Exercises on Lesson 4

GAPPI		Analyze	• Evaluate	The second second
Choose the correct answ	ver :			● Create
Choose the correct can	be stored in			
. Chemical of the Sy		h hat	tons only	(Giza 2022
fond Othy		o. Dut	tery only,	
c. television and food.	ithout	u. 100: to obtain the	d and battery.	
2. Humans cannot live w	itilout	ro opraili fue	needed energy for	doing their
activities.		le alst.	de e	
a. reading books			/ing cars	
c, watching television			ing food	
Choose from column (B)	what suits	it in column	(A):	(Cairo 2022
(A)			(B)	
1. Food	a. It can	be transform	ed into potential er	nergy.
2. Kinetic energy	b. It is th	e source of e	energy for humans.	
3. Potential energy	c. It is th	e stored ene	rgy in an object.	
	d. It can	not transferre	ed into another form	of energy.
1	######################################	3	4000000	
Put (//) or (x) :		-		
1. Orange, potato and b	attery contai	n stored cher	mical energy.	(
2. A car does work when				(
3. Burning of food inside				n da
our activities.	our bodies	produces on	orgy maraness as a	(
Write the scientific terr	n of each of	the following	g :	
1. The type of fuel that i	s used inside	e the car to ol	btain kinetic energy	t ()
^{2. The} energy that is sto	ored in both f	ood and batte	eries.	(
What happens if?				
1. Food burns inside the	. bugaan bad	v		
	numan bod	у.		

2. You put a battery inside a flashlight, then switch it on.

(according to the change of energy

Evaluate

Write each of the following words in front of the suitable sentence below:

(Flashlight - Gas oven - Food)

- Its burning changes the chemical energy into kinetic energy inside our bodies.
- 2. It changes chemical energy into thermal energy to be used in cooking.
- 3. It changes chemical energy into light and thermal energies.

Complete the following sentences below pictures:

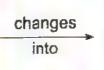


Batteries inside the radio store potential

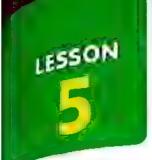
energy.

changes

in the wires inside the radio.



produced from the radio speaker.



Activity 12

Record Evidence like A Scientist

this concept, you have learned about energy, motion, forms of potential and kinetic energy, and energy transformation in engines.

Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learnt in the previous concepts.

7 Step 1 The Question

How do moving objects get energy and what are the changes of energy that take place inside them?

Step 2 My Claim

Step 3 My Evidence

Step 4 My Scientific Explanation

Optional Digital Activity

Hidence

Activity 13 "Kinetic Energy and Potential Energy in Winter Sports" in the school book is an optional digital activity. You can do this activity by scanning its QR code in your school book.

Activity 14 Review: Energy and Motion

We can summarize this concept in the following main points:

- * Energy is very important in our life and it is found everywhere around us.
- All moving objects have kinetic energy.
- The roller coaster has the most potential energy when it reaches the highest point of the hill. This energy changes into kinetic energy when the roller coaster races down the hill.
- The kinetic energy increases as the speed increases.

Forms of energy:

- Mechanical energy.
- · Chemical energy.
- Thermal energy,

Light energy.

- Electrical energy.
- · Sound energy,

Energy:

It is the ability to do work or to cause change.

Work:

It is a force that causes an object to move a distance.

Potential energy:

It is the amount of energy that is stored in an object due to its position.

Kinetic energy:

It is the energy of an object due to its motion.

- Energy can be stored and changed from one form to another.
- Potential energy changes into kinetic energy and vice versa.

Forms of potential energy:

- Gravitational potential energy.
- Chemical potential energy.

Forms of kinetic energy:

- Sound energy.
- Electrical energy.

- Light energy.
- Thermal energy.

potential energy of any object depends on :

the object is (the mass of object).

1. How high the object is above the Earth's surface (the height of the object from the Earth's surface).

50me changes of potential energy into kinetic energy:

Example	Energy changes			
	From	Into		
Flashlight.	Chemical energy.	Light energy and thermal energy.		
Gas oven.	Chemical energy.	Thermal energy.		
Normal car.	Chemical energy.	Kinetic energy, sound energy and thermal energy.		
Spring-powered car.	Potential energy.	Kinetic energy.		

The chemical energy stored in food changes into kinetic energy that helps us to do activities.

Energy cannot be created or destroyed, but it changes from one form into another.

In the Assessment Book:

Try to answer:

- Self-Assessment (32)
- Model Exam on Concepts (2.1) & (2.2)

Model Exam on Concept (2.2)

Total m
20
15

(A) Choose the correct answer:

- 1. When an object moves down a ramp, its stored potential energy
 - a. increases.
 - b. doesn't change.
 - c. changes to a less active form of energy.
 - d. changes to a more active form of energy.
- 2. The form of energy that can be seen is
 - a, thermal energy.

b. electrical energy.

c. light energy.

- d. sound energy.
- 3. All the following examples store chemical energy, except
 - a. food.

b. gasoline.

c. a battery.

- d. a compressed spring.
- 4. When you jump high in the air, the forces affecting you must be
 - a. balanced.

b. unbalanced.

c. created.

d. destroyed.

(B) Give a reason for the following:

Both the Sun and electric lamp produce two forms of energy.

2 (A) Put (V) or (X):

(5 mari

- 1. The objects that don't move have no energy.
- 2. To do work, you must push or pull an object through a certain distance.
- 3. Light waves is a form of potential energy.
- 4. Orange, potato and car battery contain stored chemical energy.
- (B) Complete the following sentences below pictures :



- Batteries inside the radio store

 potential energy.
- 2. energy in the wires inside the radio
- 3. energy produced from the radio speake

I(A) Correct the underlined words:	
When an object falls down, it has more active form of energy known as potential energy.	(5 marks)
2. Sound energy produced from the gas oven is used in cooking for	() od.
3. A battery stores a form of kinetic energy known as chemical	()
energy. 4. Gasoline contains electric potential energy.	()
(B) What happens if ?	
If a stopped ball at the top of a slope starts to move down.	
fastopped ball at the top of a slope starts to move down. (according to the change)	
If a stopped ball at the top of a slope starts to move down.	
a stopped ball at the top of a slope starts to move down. (according to the change)	
(according to the change) (A) Write the scientific term of each of the following:	(5 marks)
(according to the change) (A) Write the scientific term of each of the following: 1. The form of energy that the object has due to its movement. 2. The energy that is used to operate all electric devices.	(5 marks)
(according to the change) (A) Write the scientific term of each of the following: 1. The form of energy that the object has due to its movement. 2. The energy that is used to operate all electric devices. 3. The form of energy that is stored inside an object placed at	(5 marks) ()





Learning outcomes

By the end of this concept, your child will be able to:

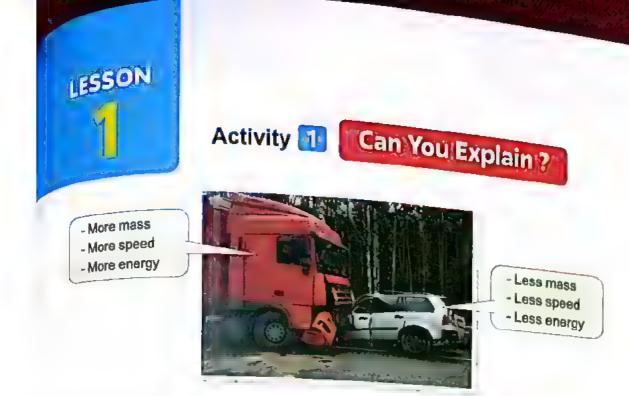
- Analyze and interpret data to describe how the speed and mass of objects relate to changes observed in a collision.
- Calculate the speed of objects using standard units of measurement.
- Construct an explanation based on evidence and togical reasoning to describe energy transfer in a collision.
- Apply mathematical thinking to organize data to represent patterns related to mass, speed and the energy of objects.

Key vocabulary

- Collision
- Mass
- Speed

Notes For Parents On Concept [2.3]

Lessons	Activities	What you should do with your child
	Activity 1	Discuss with your child that faster and heavier objects have more energy that slower and lighter ones.
1	Activity 2	Help your child to know that kinetic energy can transfer from one object to another.
	Activity 3	Help your child to find out some online sources to learn more about the importance of seatbelts and airbags during accidents.
	Activity 4	Discuss with your child the meaning of collision and let him/her mention some examples of collision between objects.
2	Activity 5	Help your child to know the relation between speed, distance and time,
2	Activity 6	Discuss with your child the effect of speed on collision between objects
	Activity 7	Discuss with your child the relation between the speed and kinetic energy of a object that moves on a ramp and the angle of inclination.
3	Activity 8	Let your child to do a simple experiment to find out the relation between force, speed and kinetic energy of a moving object
3	Activity 9	Discuss with your child the effect of mass on colerion between objects.
4	Activity 10	Let your child do a simple experiment to find out that the mass of a moving object affects its speed and its kinetic energy.
	Activity 11	Discuss with your child how kinetic energy transfers between objects.
5	Activity 12	Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation.
	Activity 13	Optional digital activity.
6	Activity 14	Let your child review the main points in this concept.



what happens to objects when they collide with each other?

- In the example above, the truck which is the heavier object has more energy than the car which is the lighter object.
- .If the truck is the faster object it has more energy than the car which is the slower object.

Therefore, during collision, the object that has more energy (the truck) causes more damage than that has less energy (the car).

cample of collision:

Awrecking ball:

it is a very heavy steel ball that swings on a cable.

It is used to collide with walls of a building to help construction workers knock down walls or parts of buildings.



Wrecking ball

this concept, we will study:

Collision of objects.

Basics of speed.

Energy and collision.

The effect of speed and mass on collision.

Energy conversions during a collision.

gr.

truck أثقل

wrecking ball أخف

construction طباحية knock down كرة الهدم

basics فولان

ر 281 مبادی

Activity 2 Collision



▶ Look at this picture, then complete the sentences by using these words:

(different - kinetic - increases).

- 1. The bat transfers its ____ energy to the ball.
- 2. The speed of the ball when the bat hits it.
- 3. When the bat hits the ball, the ball will move in a direction.



Collision in cricket:

- A cricket is a popular game all over the world.
- In cricket, a player uses a wooden bat to hit a ball.
- The cricket player holds a bat and moves it as the ball comes towards him at high speed to collide with the bat.



- What happens to the energy of the moving bat when it the moving ball?
 - The bat transfers its kinetic energy to the ball.
 - Then, the speed of the ball increases and the ball returns z ok in a different direction.
 - This collision produces a popping sound and the player would feel the bat hitting the ball.



Check your understanding

- ▶ Put (√) or (x):
 - 1. During collision between a ball and a bat, the direction of the ball will not change.
 - 2. During collision between a ball and a bat, the kinetic energy transfers from the bat to the ball.

Activity 3

Watching Objects Collide

What happens to the driver's body when the car stops suddenly?

- , The driver's body continues to move forward where the objects that are in motion stay in motion until something stops them.
- But, What are the safety equipment that keep the driver and passengers in their places?

Safety equipment used during collision of cars

1) Seatbelts:

They are used in cars to keep the driver and also the passengers from moving forward when the car stops suddenly, so seatbelts have saved thousands of lives.



Airbags :

Their structure:

Airbags are made up of thin nylon material folded into the steering wheel, seat inchboard or doors.

Idea of operation:

- -During collision, airbags whate automatically when sensors in the car detect a crash.
- A sensor tells the airbags to inflate and fill with a gas to provide a soft cushion.
- After collision, the airbags deflate almost as fast as they inflate, because they have holes (vents) to allow them to deflate, so the driver can get out of the car.

Their importance:

- Airbags slow the speed of the driver's motion forward.
- -Airbags absorb the energy of the car on collision.





Give a reason for ...

Airbags deflat quickly after few seconds of collision.

Because they contain small holes (vents), through which the gas comes out, so the driver can get out of the car.

حساس

Collisions between trains and cars

- There are many accidents in which a train hits a car that may be stuck on the train tracks.
- Trains are much larger than cars. Also, trains can travel at a high speed.
- It is more dangerous, as the force of the collision between the car and train increases.





Check your understanding

▶ Complete the following sentences:

- Safety equipment of cars during collision include. and
- 2. Airbags are made up of _____ material.
- 3. In cars, protect passengers during collision where they inflate automatically when sensors in the car detect a crash.

in the Assessment Book: Try to answer: Self-Assessment (33)

Exercises on Lesson 1

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loderstand		-taff0
401510	400	12011

Apply

Analyze

• Evaluate

• Create

the correct answer:

Choose	reat
1. When objects collide with each a. time c. energy	h other, is transferred between them. b. distance d. nothing
2. The object that has the most k a. the fastest and lightest	kinetic energy, is object.

- b. the slowest and lightest c, the fastest and heaviest d. the slowest and heaviest
- 3. When the cricket bat hits the ball, the ball direction and the ball a. doesn't change - doesn't change,

 - b. doesn't change changes.
 - c. changes doesn't change.
 - d. changes changes.
- 4. Collisions usually produce
 - a. solar energy. b. sound energy.
 - c. gravitational potential energy. d. chemical potential energy.
- 5. If there is nothing to stop a moving object, this object will
 - a. stay in motion. b. stop after few hours.
 - c. stop after few minutes. d. stop after few seconds.
- 6. Seatbelts work when the car
 - a. decreases its speed gradually. b. increases its speed gradually.
 - c. suddenly stops. d. stops gradually.
- 7. When a car stops suddenly, the passengers move
- a. backward. b. forward.
 - c. upward. d. downward.
- 8. Airbags in the car are folded into all the following places, except
- a. steering wheel. b. dashboard.
 - c. doors. d. tires.

Coloration:

Choose from column (B) what suits it in column (A):

(A)	(B)
1. Wrecking ball	a. It is one of the safety equipment in cars that is inflated with a gas during crashes.
2. Cricket bat	b. it changes its sound energy into light energy,
3. Seatbelt	c. it is used to hit a ball during playing.
4. Airbag	d. It is one of the safety equipment in cars that keeps passengers in their places during crashes.
	e. it is used to hit a wall during destruction of a building

* * **********	4 1000000000	J	F# \$15-4-5

3	Put	(V)	or	(X)	
---	-----	-----	----	-----	--

into the tree.

•	1. When a cricket bat hits the ball, its potential energy transfers to the ball. (r
	2. Seatbelt is one of the safety equipment in cars.	
	3. During a crash between two cars, the potential energy transfers from	
	the faster car to the slower one.	
•	4. After car collision, the airbags deflate as fast as they inflate.	
•	5. When a fast car hits a very big tree, the kinetic energy or the car transfers	

4 Write the scientific term of each of the following:

- 1. A heavy steel ball that swings on a cable and is used in destruction of parts of buildings.
- 2. Safety equipment used to prevent car passengers from moving forward when the car stops suddenly.
- 3. Safety equipment used to provide soft cushion when it is inflated automatically with a gas during collision of cars.
- 4. They are present in car airbags and allow them to deflate fast after collision.

[5] Correct the underlined words:

- A fast and heavy object has more potential energy than a slow and light object.
- 2. Football is used to collide with buildings to knock down their walls. (.....

3. When a train at a night speed hits a car, the train gets more damaged as a result of hitting the ball with the wooden bat, the speed hits a	~- 1
4. As a result of hitting the ball with the wooden bat, the speed of the ball doesn't change.	
5. Seatbelts absorb the energy of the car due to its collision and gets inflated.	()
6. Airbags are made up of thick wooden material. 7. The cricket bat transfers its light energy to the ball.	() ()
Complete the following sentences: 1. When a bat hits a ball strongly, the energy of the bat is trathe ball and the speed of the ball	
 2. Among safety equipment which are used during collision of cars . and 3. As a result of collision between the ball and the bat, the direction of cars . 	
 vill	soft cushion. en them.
Give reasons for : 1 The speed of the hell increases when the het hits it herd	
1. The speed of the ball increases when the bat hits it hard. 2. Seatbelts in cars are very important.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
3. Airbags in cars are very important.	
What happens if ?	
1. The moving cricket bat hits a ball (according to the transit	er of energy).
² -Airbags in a car don't inflate during a crash.	
* ***CALITY OF CHAPTER OF THE CONTROL OF THE CONTROL OF THE CALIFORNIA OF THE CALIFO	

- Look at the opposite photo that shows a tennis player, then choose the correct answer:
 - 1. energies are produced from the collision between the racket and the ball.
 - a. Electrical and kinetic
 - b. Kinetic and light
 - c. Electrical and sound
 - d. Kinetic and sound
 - 2. When the racket hits the ball, the of the ball is changed.
 - a. size
- b. mass
- c. direction
- d. color
- 3. During hiting the ball with the racket, all the following sentences are correct except
 - a. the ball changes its direction.
 - b. kinetic energy transfers from the racket to the ball.
 - c. the speed of the ball changes.
 - d, the size of the ball decreases.

10	Look at the opposite photo that shows a crash between a train and	a car,	then
	answer the questions below:		

•	1. In your opinion, which one of them is damaged more than the other? (Give a reason for your answer).

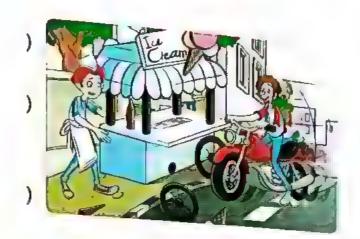
2. What happens to the car airbags during the crash?



Activity 4 Energy and Collisions

Look at this picture, then put (√) or (x):

puring collision between two objects, there is no change of energy occur. (The motorcycle has a potential energy as it is running on the street. The kinetic energy of the motorcycle transfers to the ice cream cart during collision.



vergy and collisions:

.When two objects bump or crash with each other, we can say a collision happens

Collision:

It is the moment where two objects hit or make contact in a forceful way.

·When two objects collide with each other, an amount of energy transfers occurs and also changes of energy occur.

kample of collision between two objects:

What happens if you are running down the street without looking in front of you and hit atraffic sign post?

In this situation:

- *You will stop moving forward.
- *You may bounce off and get hurt.
- 'The traffic sign post may vibrate.



- ► In the previous example, what are the changes and transfer of energy the take place?
 - The kinetic energy transfers from your body to the traffic sign post. This leads to the vibration of the traffic sign post.
 - A part of your kinetic energy changes into a sound energy (the sound you hear of collision).



Check your understanding

▶ Look at the following picture, then complete the sentences using these words:

bread - kinetic - collides - cart

- 1. The bicycle has ____ energy as it is running on the street.
- 2. When the cyclist with the bread cart, the kinetic energy of the bicycle transfers to the, that causes the cart tips over and the bread scatters.



Activity 5 Basics of Speed

saids of speed

THE RE INCH LEADING OF SHE SHE WASHING BY IN WHIGHT

1

the asserts traveled in a centain amount of time.

producting the speed :

Traculate the speed of any moving object, we can divide the distance that the mediances by the time taken to travel that distance as follows:

> Speed = Distance (in Kilometer or meter)
>
> Time (in hour or second) (in hour or second)

50 me can define speed also as, distance per unit time. The measuring unit of speed may be ;

Kiemeter Per Hour (km/hr) Meter Per Second (m/sec.)

Fire speed of an object is not affected by the direction of this moving object.

Example:

facar moves forward 5 meters in one second, then it moves backward trees in one second, so its speed is still 5 meters per second.

toblems:

Amir runs 100 meters in 20 seconds. Calculate the speed of Amir.

$$\frac{100}{20} = 5 \text{ m/sec.}$$

Distance = 100 m Time = 20 sec

2 labus traveled 600 kilometers in 5 hours. Calculate the speed of the bus.

$$\frac{600}{5}$$
 = 120 km/hr.

Distance = 600 km Time = 5 hours

Comparing the speed of two moving objects:

- To compare the speed of two moving objects, we can use one of the following two ways:
 - 1. Measure the distance that both objects travel in the same amount of time.
 - The object that travels a greater distance in the same amount of time is moving at a greater speed.
 - Example : If two runners run for 1 hour, where:
 - The first runner travels 6 kilometers.
 - The second runner travels 9 kilometers So, the second runner is moving at a greater speed, because he travels a greater distance (9 km) in the same amount of time (1 hour).



- 2. Measure the time that both objects take to travel the same distance
- The object that travels the same distance in a smaller amount of time is moving at a greater speed.
- Example : If two cars are racing 120 kilometers. where:
- The first car reach the end line of race in 1 hour.
- The second car reach the end line of race in 2 hours.
 - So, the first car is moving at a greater speed, because it travels the same distance (120 kilometers) in a shorter time (1 hour).





Check your under tranding

- ▶ Complete the following sentences:
 - 1. A car that travels 90 kilometers per hour is than a car that travels 60 kilometers per hour.
 - 2. Two bicycles are racing for 500 meters, the bicycle that finishes the race in a greater time is than the bicycle that finishes in a shorter time.
 - 3. The distance per unit time is known as



The Effect of Speed on Collisions

from the previous concept, you have learned that as the incline of the ramp increases, the speed of the object increases.



- The amount of kinetic energy of an object depends on :
- .The mass of object.
- .The speed of object.
- , Now, we are going to study the effect of speed on collisions.
- When a fast object hits another object, the fast object transfers some of its energy to the other object, where:
- · By increasing the speed of the object, the energy that transfers during collision will increase.
- · Some of this transferred energy may be in the form of heat, light or sound.



· Comparison between a fast-moving object and a slow-moving object :

object			
Fast-moving object	Slow-moving object		
• It has more energy.	It has less energy.		
 When this object hits another object, it exerts more force. 	When this object hits another object, it exerts less force.		
 This force causes a big damage to the object that cannot be repaired. 	This force causes less damage to this object than the fast-moving object.		

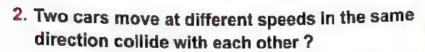
Note

Driving fast is very dangerous, because if a car increases its speed, its kinetic energy increases that results in exerting a large force during an accident.

What nappens if ...?

1. Two cars move at different speeds in opposite directions collide with each other?

The forces exerted in the accident depend on the speed of both cars, so damage would be much more severe because they move in opposite direction.



The forces exerted in the accident depend on the speed of both cars, this leads to damage that would be less severe because they move in the same direction.







हिंद्यबर्द काम माहित्यस्थाहीहरू

- Complete the following sentences:
 - The amount of kinetic energy of an object depends on both and of this object.
 - 2. Fast-moving objects have kinetic energy, while slow-moving objects have kinetic energy.
 - 3. By increasing the speed of an object, its kinetic energy

Activity Racing Downhill

have learned about speed and energy, in this activity you will measure the have learned the kinetic energy of an object moving down a cardboard tube at various ;line angles.

let's study the relation between speed and kinetic energy.





Toy truck



Metric ruler



Cardboard paper towel tube



Paper cup



Stopwatch



Scissors

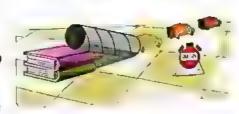


Books

Steps

Part (1): The relation between the speed and the angle of inclination.

- 1. Put one end of the tube on the top of two books, and the other end of the tube resting on the ground.
- 2. Record in a table the number of books used to set up the tube in the column "Number of books".
- 3. Roll the truck down the tube. Use the stopwatch to determine the time and record in the table how long the truck takes to travel to the end of the tube in the column "Time to travel".



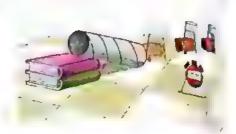
4. Add one book to change the incline angle and repeat the steps, then add another book and repeat the steps again.

Note

As the "Time of travel" is less, the speed of the toy truck is higher.

Part (2): The relation between the kinetic energy and the angle of inclination

- Now, repeat the activity as In part (1), but place the paper cup at the bottom of the tube as shown in the figure.
- 6. Measure the distance the cup moves each time after the truck rolls into it, and record in the table the distance that the cup travels in the column "Distance the cup traveled"





As the "Distance the cup traveled" is longer, the kinetic energy of the toy truck is greater.

	Part (1)	Part (2)	
Number of books	Time to travel	Distance the cup traveled	
2 books	5 seconds	3 cm	
3 books	3 seconds	4 cm	
4 books	2 seconds	7 cm	

Observations

- As the angle of inclination increases, the speed of the truck increases as it takes less time to reach the end of the tube.
- As the angle of inclination increases the distance that the paper cup traveled increases.

Conclusions

- As the speed of a moving object increases, its kinetic energy increases.
- Both speed and kinetic energy increase, as the angle of inclination increases.



Check your understanding

▶ Complete the following sentences using the words below :

(increases - faster - kinetic)

- 1. If the incline of a ramp increases, the object rolling down it will be
- 2. When the speed of an object Increases, its kinetic energy
- 3. We can use the speed of an object to know the energy of this object.

In the Assessment Book.

Try to answer:

Self-Assessment

Exercises on Lesson 2

O A mmlas	The second secon	
tand (Application	 Analyze 	THE R. P. LEWIS CO., LANSING, MICH.
, Understand		• Evaluate
the correct answer:		- auto

	a la o	correct	answer	
- chanse	the	Collect	answer	•

When two objects of the same mass move with	the
When two objects of the same mass move with each other, the resulted damage	the same speed collide with
a is larger in one of them and smaller in the off	

- a. is larger in one of them and smaller in the other.
- b. is equal in both of the two objects.
- c. doesn't depend on the mass of the two objects.
- d doesn't depend on the speed of the two objects.
- 2. On collision energy is
 - a. created.
 - b. destroyed.
 - c, created and transferred.
 - d. transferred and change.

3. How can we calculate the speed o	f an object 2	
a. Speed - distance + time	b. Speed = distance x time	(Alexandria 2022)
c. Speed = distance + time	d. Speed = distance x time	

- d. Speed = distance time
- 4. Which of the following is a measuring unit of speed?...... a. hr/km. (Cairo 2022) b. sec/m. c. kg/sec. d. m/sec.
- 5. What is the speed of a car that travels 400 meters in 4 second?......
- a. 100 m/sec. b. 20 m/sec. c. 30 m/sec. d. 40 m/sec.
- ▶ 6. As the angle of a ramp decreases, the speed of a toy car rolling on it and its kinetic energy
 - a. increases decreases. b. increases - increases. c. decreases - decreases. d. decreases - increases.
- 7. An object keeps moving with same speed when
 - a. its kinetic energy decreases.
 - b. its potential energy increases.
 - c. no another force stops it.
 - d. another object collides with it.
- * 8. The two factors affecting the kinetic energy of an object are
 - a. its speed and the color. b. Its mass and the color.
 - c. its speed and the mass. d, its light and the sound energies.
- * 9. The mass of an object
 - a. doesn't affect its potential energy or its kinetic energy.
 - b. affects its potential energy and its kinetic energy.
 - c. affects its potential energy only.
 - d. affects its kinetic energy only.

• Create

_	Chaose from column	. 14 lm	column (A):
2.1	Chanse from column	(R) what suits It III	

(A)	a. has much kinetic energy.	
A heavy object that doesn't move A light object that doesn't move	 a. has much light energy. b. has much light energy. c. if it moves with a fast speed, it ham much kinetic energy. 	
A fast object with a heavy mass A slow object with a light mass	d. has low kinetic energy. e. if it moves with a low speed, it has low kinetic energy.	
2	3	

3	Put	(V)	or	(x)	1
	1 Page 10	V" /	-		

- 1. Fast-moving objects can be exposed to less damage than slow ones.
- 2. A slow and light object has much kinetic energy.
- 3. We cannot create a new form of energy and also we cannot destroy an existing form of energy.
- 4. You have to drive a car as fast as possible, because at high speeds you can avoid collisions.
- 5. To increase the speed of a moving object, you can collide it with another object that moves in the opposite direction.
- 6. When two heavy and fast cars move in opposite directions collide together, they produce very small amount of damage.
- 7. If two objects cover the same distance in the same time so, they have similar speed.
- 8. We can measure the covered distance in kilometer unit.
- 9. If car (A) covered a distance of 100 kilometers in one hour and car (B) covered a distance of 100 kilometers in two hours so, car (B) is faster than car (A).
- 10. The angle of inclination of a ramp affects the speed of an object moving on it.

Write the scientific term of each of the following:

- 1. The process in which two objects or more crash into each other, and including an energy transfer,
- 2. The energy that can be heard and usually produced when two objects collide with each other.
- 3. The liquid that stores chemical energy and used to move cars.
- 4. The distance that an object traveled in a certain amount of time.

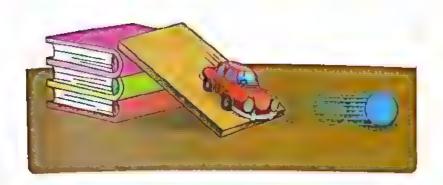
the underlined words.	
Correct the underlined words. Correct the underlined words. Correct the underlined words. Correct the underlined words. Correct the underlined words.	tential energy transfers from
	/
	nergy. ()
2. The speed of the same mass and placed at 3. Two objects of the same kinetic energy.	the same height
3 Two objects of the same kinetic energy.	, ,
When the speed of all object increases, its kir	netic energy decreases. ()
Complete the following sentences :	
1. The moment when two objects fitt of make co	
2. When a moving car hits a tree, a part of energy which you hear it.	
3. When the speed of a car increases, its	energy increases.
4. A car with speed = 60 km/hr., its kinetic energon with speed = 40 km/hr, if they have the same	ame mass.
5. When two cars collide with each other, some heat, and	of energy may change into
6. The speed depends on the distance that is n and the time that is measured in or .	neasured in kilometers or
7. A car covers 80 meters in 4 seconds, so it m	oves at a speed equals
8. If the kinetic energy of a moving body decrea	ases, its speed will
Give reasons for :	
1. When two objects collide with each other, you	u can hear a sound
· · · · · · · · · · · · · · · · · · ·	
10 mar.	***************************************
¹ 2. Driving fast is very dangerous.	
***************************************	THE DESIGNATION OF THE PROPERTY OF THE PROPERT
Wheel	26))))))))))))))
What happens if ?	
1. The speed of a car increases.	(according to its kinetic energy)

2. Two bicycles move in an opposite direction,	collide with each other.
-7500 move in an opposite direction,	DOUGO WILL COOL COMM.
* *** *** *****************************	

Understand

Activity 8 Speed and Collisions

pokat this picture which represents a toy car collides with a small ball, en choose the correct answer:



By increasing the speed of the car, the kinetic energy of this car.

(decreases – increases – doesn't change)

The ball moves a distance due to

of the car.

(force - speed - force and speed)

ou have learned from the previous lessons that:

By increasing the force of an object



The kinetic energy of this object increases.

By increasing the speed of an object



The kinetic energy of this object increases.

low, we are going to carry out an activity to show the effect of force and speed of moving object on its kinetic energy during collision.

Tools



Modeling clay



Piece of cardboard



Hard surface (wooden table)

Steps

- 1. Roll a ball of clay in your hands and smoothing its sides.
- Use the cardboard to make a landing platform, where the clay ball falls on and place this platform on a hard surface like a wooden table.
- 3. Hold the clay ball at a distance 1 meter above the platform.
- 4. Lightly open your hands to drop the clay ball onto the platform without throwing it.
 - Observation The shape of the clay ball changes a little and becomes irregular after hitting the platform.
- 5. Smooth the clay ball over and lift it up to 1 meter above the platform, then repeat the experiment again, but this time throw the clay ball with a gentle force to increase its speed.
 - Observation The shape of the clay ball change more and becomes more irregular after throwing it gently.
- Repeat the experiment one more time and throw the clay ball with a hard force, so its speed increases much more.
 - Observation The shape of the ball changes much more and becomes completely irregular after hitting the platform.









Conclusions

- As the force on an object increases, its speed and the amount of its kinetic energing increase.
- As the kinetic energy of a moving object increases, more damage will happen to this object during collision.



Check your understanding

▶ Put (√) or (x):

By increasing the force on an object, its speed and kinetic energy increases.

The Effect of Mass on Collisions

have learned from the previous lessons the effect of speed on

ollisions.

ollisions. we are going to study the effect of mass on collisions.

erelation between the mass of objects and their kinetic energy:

Different vehicles have different masses, where a large truck has a much greater mass than a car.

If a large truck is traveling at the same speed of a car, the truck has more kinetic energy than the car, so the truck needs a bigger engine than the car.

As the vehicle moves faster, the amount of fuel that burns inside its engine increases to provide it with more kinetic energy.

As the mass of an object increases, its kinetic energy increases.

rom the previous explanation, we can conclude that if the truck and the car nove at the same speed, we will find that:



The truck:

- Has a big mass.
- Has a big engine.
- Uses more fuel.
- Has more kinetic energy.



The car:

- Has a small mass.
- Has a small engine.
- Uses less fuel.
- Has less kinetic energy.

Give a reason for ...

The truck whose mass is 1 ton has half the kinetic energy of another truck that has mass 2 ton when they both move at the same speed.

Because if the mass of an object increases, its kinetic energy at the same speed thides

engine شأحنة

ينحرك

303

The effect of mass on collisions:

 A large-mass vehicle causes more damage when it hits something than a small-mass vehicle traveling at the same speed.

What happens If ...?

1. A bicycle moving at a speed of 50 km/hr hits a person. The bicycle will cause some injuries to this person, but he will survive.



2. A car moving at a speed of 50 km/hr hits a person. The life of this person may be endangered.





Check your understanding

- Complete the following sentences:
 - ... mass, while small car has a mass. 1. A big truck has a
 - 2. If the mass of an object increases, its kinetic energy

In the Assessment Book Try to answer: Self-Assessment 35

Exercises on Lesson 3

The second livery with			
OAPPly	Analyze	• Evaluate	• Create
land			
arroct answer:			
	o move.		
very big truck needs t very small engine	b. small eng	jine	
very big engine	d. no engin	e	
the force that acts on an o	object increases, it	s ability to do wa-	
s the force that are	b. decrease	es asimy to do work	*********
increases. doesn't changed.	d. destroye		
doesn't changes			
When a moving car decrease	es its speed then s	stops, so	
its kinetic energy becomes	3 ZGIU.		
h, its light energy only become	les zero.		
tis light energy and therma	s energy become	zero.	
d. its kinetic energy become			
The amount of fuel that is us			
kinetic energy is the ar	mount of fuel in a s	small car to get the	same amoun
of kinetic energy.			
a. less than	b. equal to		
c. more than	d half to		
On a flat road, if a large truc	k is traveling at the	e same speed of a	small car, the
the truck has			
a. more kinetic energy.			
b. less kinetic energy.			
c. the same kinetic energy	of the car.		
d. no kinetic energy at all.			
If an object moves down al	ong a ramp, as the	incline angle of the	e ramp
increases the speed of the	object will		
a. decrease.	b. increas	е.	
c. not change.	d. become	zero.	
The factor that affecting the	e kinetic energy of	two objects when ti	ney move with
the same speed is	o miliono dilongy of		
a. their colors.	b. their so	und energy.	
c, their masses	d their te	mneratures.	
8. When a car stops, all the f	following become z	ero, except	
a. speed. b. kinetic	energy, c. mass.	d, work.	

(......

Choose from column (B) what suits it in column (A):

Jnderstand

(A)	(B)
Large-mass vehicle with speed 100 km/hr	a. It has a big amount of kinetic energy.
2. Small-mass vehicle with speed 20 km/hr	b. It has no kinetic energy.
Small-mass vehicle that doesn't move	c. It has the most thermal energy.
	d. It has a small amount of kinetic energy.

4	2	3
	Z	

3 Put (🗸) or (x) :

- 1. A small object moving at a low speed has a big amount of kinetic energy.
- 2. The force that acts on an object doesn't affect its speed.
- 3. The smaller the mass of the vehicle, the less fuel it consumes.
- 4. Objects of equal masses and move at different speeds have the same kinetic energy.
- 5. Speed and mass are the factors that affect the kinetic energy of a moving object.

Correct the underlined word:

- 1. A two-ton truck has smaller amount of kinetic energy than that of one-ton truck moving at the same speed.
- 2. All moving objects always have light energy.
- 3. The larger the mass of a car, the less fuel it consumes.
- 4. Potential energy depends on the speed of an object.

5 Complete the following sentences:

- 1. By increasing the force that acts on a moving object, its increases that causes the increase of its energy.
- 2. If the mass of a moving object decreases, its kinetic energy willat the same speed.
- 3. Traveling at the same speed, a large mass vehicle causes damage than a small mass vehicle during collision.

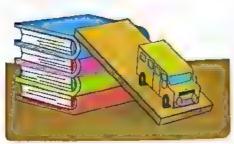
A moving train at speed 80 kr energy than th	at speed 80 km/hr. cause n/hr. during collision, as the e car.	es damage than a moving car he train has more and
	nergy depends on the spe	
6. A car moving	with the same speed.	kinetic energy than that of
	e energy that is s lows them to move.	stored in the fuel changes into
Give reasons fo	r:	
1. A truck needs speed.	a bigger engine than that	t of a small car to move with the same
*** ********* ****		
2. A car consum speed.	es less fuel than that con	sumed in a bus to move at the same
	ck has kinetic energy more	e than that of a small moving car at the
What happens		
		decreases. (according to its kinetic energy).
		es. (according to its kinetic energy).
**** ** ** *****		11000161011001 1001140 1 101
		(according to the damage during collision).
4. A truck and	a small car move at the sa	ame speed. (according to kinetic energy).
******* ** *********	*	191

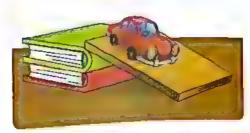




Look at these pictures, then complete the following sentences using these words:

speed - increases - greater - kinetic





- 1. By increasing the angle of inclination of the ramp, the speed of the car on this ramp
- energy increases. 2. By increasing the mass of the moving object, its
- than the mass of the toy car. 3. The mass of the toy bus is
- 4. As the mass of an object moves down a ramp increases, its increases.
- ▶ In this lesson, we will study:
 - 1. How does mass affect speed ?
 - 2. How does mass affect kinetic energy?
- How does mass affect speed?

We will carry out an experiment to show the relation between mass of objects and their speed.





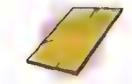
3 toy cars



· Balance (scale)



2 books



Cardboard sheet



Masking tape

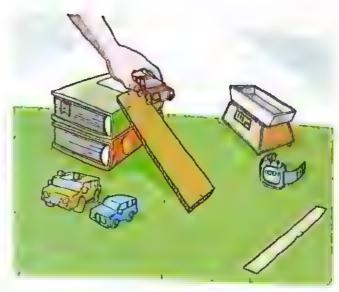


Stopwatch



Meterstick

Use the cardboard to make a ramp. place one end of the cardboard ramp on the top of two books over each other, while the other end resting on the floor. Mark a finish line with a piece of masking tape where the distance between the tape and the end of the ramp is 1 meter. Weigh the red car by using the balance and record its mass in the table below.



Release the car from the top of the ramp, while your friend hold a stopwatch to measure the time taken to cross the finish line, then calculate the speed of this car.

Repeat the previous steps using the blue car, then the yellow one and record their masses and the time taken by each of them to cover the same distance in the table below, then calculate the speed of each of them.

Observations

The results of the three toy cars are:

Cars	Mass	Distance	Time	Speed = Distance Time
Red car	110 gm.	1 m	4 sec.	1/4 m/sec.
Blue car	160 gm.	1 m	3 sec.	$\frac{1}{3}$ m/sec.
Yellow car	210 gm.	1 m	2 sec.	$\frac{1}{2}$ m/sec.

According to the table above, we can observe that:

By increasing the mass of the car, the time taken to cross the finish line decreases because the speed of the moving car on a ramp increases.

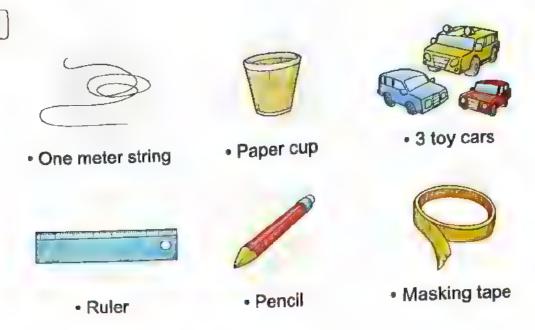
Conclusion

The speed of the moving object on a ramp increases by increasing its mass.

2 How does mass affect kinetic energy?

We will carry out an experiment to show the relation between mass of objects and their kinetic energy.

Tools



Steps

- 1. Tie one end of the string to a pencil and the other end to the red toy car.
- 2. Place the paper cup on the floor, and mark the cup's starting location on the floor with a piece of masking tape.
- 3. Hold the car straight out, so the cup is in the swinging path of the car when you let it go.
- 4. Release the toy car to collide with the paper cup.
- 5. Mark where the cup moved to using a piece of masking tape and then use the ruler to measure how far this is from the starting position.
- Repeat the previous steps using the blue car, then the yellow one and record the results in another table.

observations

The results of the three toy cars are :

Cars	Moved distances
Red car	7 cm.
Blue car	12 cm.
Yellow car	15 cm.

coording to the table above, we can observe that :

Increasing the mass of the car, the distance that the paper cup travels increases.

onclusion

yincreasing the mass of an object that moves down a ramp, the kinetic energy of his object increases.

M.			
₩.	M	-	la.
ij.	N	[+]	

The speed and kinetic energy of a moving object on a ramp can be increased by :

- 1. Increasing the angle of inclination of the ramp.
- 2 Increasing the mass of the object.

Check your understanding

Put (√) or (x):

- 1. By increasing the mass of an object that moves down a ramp, its speed decreases.
- 2. By increasing the mass of an object that moves down a ramp, the kinetic energy of this object increases.

In the Assessment Book: Try to answer: Self-Assessment (36)

Exercises on Lesson 4

Understand

श्रीकृद्धि 🕲

· Analyze

Evaluate

Create

Choose the correct answer:

- 1. If the angle of inclination of a hill increases, the kinetic energy of an object moving down it will
 - a. decrease.

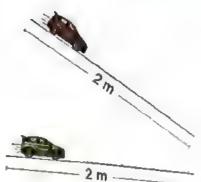
b. increase.

c remain as it is.

- d. be destroyed.
- 2. Which of the following speeds is the most dangerous on the driver's life $_{0\text{R}}$ collision?
 - a. a car moves at 50 km/hr. on a flat road.
 - b. a car moves at 50 km/hr. on an inclined road.
 - c. a car moves at 100 km/hr. on a flat road.
 - d. a car moves at 100 km/hr, on an inclined road.
- 3. All the following factors affect the kinetic energy of a moving car, except
 - a, the mass of the car.
 - b. the pushing force of the car engine.
 - c. the airbags inside the car.
 - d, the inclination of the road on which the car moves.
- 4. As the mass of a vehicle increases, it needs to
 - a. less force less potential energy.
 - b. more force more potential energy.
 - c. less force less kinetic energy.
 - d. more force more kinetic energy.
- 5. In the opposite figure, the car moves from point (A)
 - to point (B), so its kinetic energy
 - a. increases then increases then decreases.
 - b. decreases then decreases then increases.
 - c. decreases then increases then decreases.
 - d. increases then decreases then increases.



- 6. The following figure shows a ramp and a flat surface of 2 meters length for each. The following has are pushed with equal force at the same moment, a. both cars reach the end of the ramp at the
 - same moment.
 - b. the yellow car reaches the end of the ramp first.
 - c. the red car reaches the end of the ramp first.
 - d, the yellow car has kinetic energy larger than that of the red car.



Choose from column (B) what suits it in column (A):

(A)	(B)
1. The mass of the object 2. The height of the object	a. affects the kinetic energy of the moving object, but doesn't affect its potential energy.
from Earth's surface 3. The speed of a moving	b. affects both kinetic and potential energies of the object.
object	c. when it decreases, the kinetic energy increases
	d. when it increases, the stored potential energy increases.
1 2	3

Put (✓) or (X):

 1. Similar objects placed at the same height above the Earth's surface, have the same potential energy.) 1 2. The potential energy stored inside a body at 3 meters high is more than that stored inside the same body at 1 meter high. 3. When two similar objects move with the same speed, they have different kinetic energies. 4. The angle of inclination of a ramp doesn't affect the kinetic energy of an object moves on it.)

* 5. When the mass of an object increases, it need less force to move.

)

O APPLY

4	Correct the underlined words:	ball rolling
*	Correct the underlined words: 1. When the inclination of a ramp decreases, the kinetic energy of a down increases.	(
	down increases	ects
	down increases. 2. Kinetic energy of an object doesn't depend on its speed which aff	()
	its potential energy.	, , , , , , , , , , , , , , , , , , , ,
	its potential energy. 3. When an object moves at a very high speed, it has a small	()
	amount of kinetic energy.	(11111111111111111111111111111111111111
	Billiount of killetic chergy.	
5	Complete the following sentences:	inetic energy
_	down a lamping	inche chergy
	1. By increasing the mass of a toy car that moves down a will, so the time it takes to cover the same distance will	bo increased
	will, so the time it takes to cover the same can 2. The speed and energy of a moving object on a ramp can	De increased
Ī	by increasing the of the ramp.	to a ship at
•	3. If the angle of inclination of the ramp decreases, the speed of the	ving objects on
	it will it will a speed of a truck with mass 1 to	on will be
•	4. If two trucks move down a hill, the speed of a truck with mass 1 to	
	than that of another truck that has mass 2 tons.	2 meters is
6	5. The kinetic energy of an object sliding down a ramp from height 2 than that of the same object when sliding down another height 4 meters.	ramp from
6	Give reasons for 1. A car with mass = 3 tens moves down a hill reaches its . from fas	ter than
	another car with mass = 1 ton moves down the same his.	
		Establish abbitations I t
•	The speed of a truck is more than that of a car when both of ther a ramp.	n move down
7	What happens if ?	
•	1. The mass of a toy car that moves down a ramp increases.	
	(according to the time taken to reach th	e end of ramp).
	The state of the second state of the state o	n na taga da ka taga d
	2. Increasing the angle of inclination of a ramp where a ball moves d	own on it.
	(according to	
	(according to	(116 Dall aboat)

*at the opposite figures that show a	toy truck moves	
wat the opposite rigures that show a wat the opposite rigure rigures that show a wat the opposite rigures that show a wat	speed ?	Ramp (A)
there is a small toy car moves on rample toy truck. Which one of them become car or the truck? (Give a reason for	es faster,	Ramp B
What happens when increasing the ang	le of inclination of	of ramp (B) ? the speed of the truck).
a ramp road, there are two vehicles on and with speed 70 km/hr. and vehicles km/hr.	eie (B) of mass 2	vehicle (A) of mass tons and with speed
inetic energy of vehicle (A) will be small inetic energy of both vehicles will equal ass of vehicles affects their kinetic energy.	or (x) in front of t aller than that of	

LESSON 5

Activity 11 Energy Conversions During a Collision

)

Look at this picture, then put (√) or (x):

- When you push your marble, the kinetic energy of your hand transfers to the marble.
- During collision between marbles, some of kinetic energy of your marble changes into sound energy.



- ▶ You have learned that when two objects collide with each other, transfer an changes of energy take place such as:
 - When you play a game with marbles, kinetic energy is transferred from your had to the first marble, then there is another transfer of energy from your marble to ones you hit.
 - Some of the kinetic energy is changed into sound energy when you hear thed sound during collisions between marbles.

Energy and Arsida aduring a collision of a on's cradle:

- When Newton's cradle ball is raised up without leaving it go, it stores potential energy and doesn't have any kinetic energy.
- When you leave the ball moves in the direction of the rest balls, the potential energy decreases gradually and changes into kinetic energy.
- Most of kinetic energy in the Newton's cradle is transferred from the first ball to the rest of balls, so the number of balls moving on both sides is equal.
- Some of kinetic energy of the first ball is changed into other forms of energy such as sound energy and thermal energy that are produced during collision, where:







Some of this kinetic energy changes into sound energy that is produced during the collision between balls.

50me of this kinetic energy changes into thermal energy that is produced due to the friction between the string and the other parts of Newton's cradle and also during collision between balls.

Some of this kinetic energy changes into other forms of energy due to the friction of air with the ball during its movement.

Notes

- 1. If you leave the moving balls of Newton's cradle long enough, their kinetic energy decreases gradually until they stop after lots of collisions.
- Energy is conserved during collision, so it cannot be destroyed, but the amount of energy before the collision is equal to the amount of energy after the collision.

Check your understanding

Look at the opposite picture that shows a car collides with a traffic sign post, then complete the following materials using these words:

(therm: -sound)

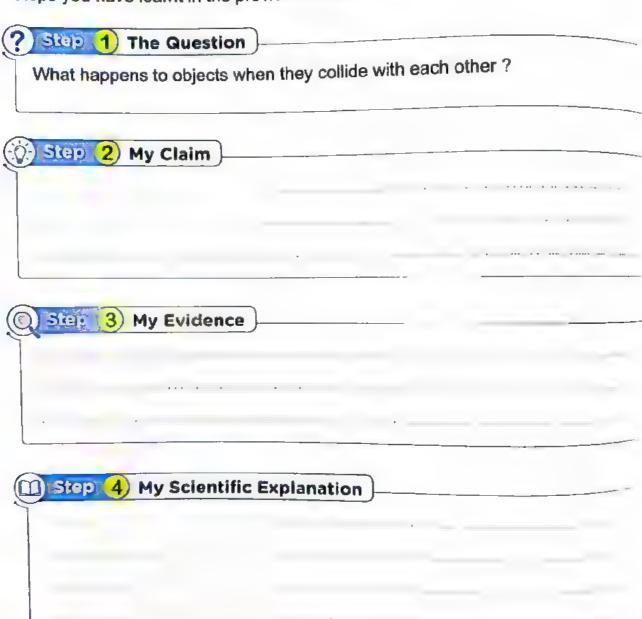
- Apart of energy is changed into energy that are you can hear.
- 2. Another part of energy is changed into _____ energy due to friction between the car and the traffic sign post.



In the Assessment Book:
Try to answer:
Self-Assessment 37

Activity 12 Record Evidence like A Scientist

- In this concept, you have learned about energy, collisions and the effect of speed and mass on collisions.
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learnt in the previous concepts.





Activity 13 " Crash Investigator " In the school book is an optional digital activity. You can do this activity by scanning its OR code found in can do this avtivity by scanning its QR code found in your school book.

Exercises on Lesson 5

			Caroll F	
• Lnderstand	O Apply	● Analyze		
1 Choose the corre	ect answer :		Evaluate	• Create
 1. During collision a. created and b. destroyed a c. changed and d. created and 2. If two objects of energy before a. triple 3. In Newton's crego, so	changed. Inditransferred. Inditransferre	her, the energy c. half eve a ball away ball. ed into kinetic entring into kinetic entring into potential entring into potential entring	d. equal to from the others a energy energy	the
 5. When two ball happens as a a. one ball c. three balls 6. When you throa. no damage c. energy is de 	s are pushed away result of collision of the ball of clay structures to the ball. estroyed. Deed, a large mass all energy	b. two balls d. four balls ongly at a wall b. more dan	e right side. , there is nage occurs to the	ball.

1. Kinetic energy	the ear causing
Potential energy Light energy	 a. form of energy that reaches the ear causing hearing. b. type of energy transferred from one moving ball another rest one in Newton's cradle. c. the energy that doesn't exist in Newton's cradle during collision. d. the energy stored in the first ball of Newton's cradle when you raise it up.
1, 2	3
their kinetic energy is 2. Some kinetic energy cradle, into sound an	is changed during collisions of balls in Newton's nd thermal energies. energy that don't exist in Newton's cradle during collision.
 A smaller and slower and faster object. 	r object has more kinetic energy than that of a larger <i>t</i>

5 Complete the following sentences:

 1, The energy changes into energy when the Newton's cradle ball moves towards the rest of balls.

and the other parts of Newton's cradle is sound energy.

• 2. Most of energy in the Newton's cradle is transferred from the first ball to the rest of balls.

When a marble hits another one, son	ne of energy changes into
-AT 101110-13	
'an COllision Detween Notition's Ci	radle balls, some of energy
changes into energy due to t	ine between the string
pue to of air with Newton's of changes into other forms of energy.	cradle balls, some of energy
In Newton's cradle, when you rise up changes into energy when y	o one ball, it stores energy that
Newton's cradle long enough until the	ually when you leave the moving balls of
ive reasons for :	
You can hear a sound during collision	on between marbles
The amount of energy before collision	on is equal to the amount of energy after
collision.	
What happens if ?	
The Newton's cradle ball is raised u	ip without leaving it go.
The Assoc Designation	(according to its energy).
of Newton's cradle	move towards the rest of balls.
· ·	(according to the change of energy).
Friction occurs bothers !!	and the other parts of Newton's cradle during
collision.	and the other parts of Newton's cradio damy
9. 91 Gr.	(according to the change of energy).
***************************************	an expense of their

Arrange the following senter cradle balls in the correct of () Kinetic energy is trans () Potential energy of the () Kinetic energy of all the () Raise up the first ball	sferred from the first bal ne first ball decreases ar palls decreases gradual	ll to the rest of balls. nd changes into kinetic _{enero} y until they stop.
 Look at the opposite figure the correct answer: 1. When you push the marb of your hand transfers to a sound c. kinetic 	e, then choose	03-5-0-1

2. During collision between your moving marble and other marbles, some

b. kinetic - sound

d. sound - potential

of the energy of your marble changes into energy.

3. If a marble rolls down a ramp, the speed of the me are decreases

Create

a, sound - kinetic

c. thermal - kinetic

by



Activity 14

Review: Energy and Collisions

, We can summarize this concept in the following main points:

- When two objects collide with each other, an energy transfer occurs and also changes of energy occur.
- A faster and heavier (more mass) object has more energy, so it causes more damage than a slower and lighter (less mass) object.
- . Safty equipment used during collision of cars are seatbelts and airbags.
- Seatbelts are used in cars to keep the driver's body and also the passengers from moving forward when the car stops suddenly.
- · Airbags slow the speed of the driver moving forward and absorb the energy of the car due to its collision.

Collision:

It is the moment where two objects hit or make contact in a forceful way.

Speed:

It is the distance traveled in a certain amount of time.

- · Common measuring units of speed .
 - -Meters per second (m/sec).
 - -Kilometers per hour (km/hr or kph).
- The object that travels the greater distance in the same amount of time is moving at a greater speed.
- The object that travels the same distance in the smaller amount of time is moving at a greater speed.
 - By increasing the force, mass and speed of an object, its kinetic energy increases.
 - During collision, there are changes of kinetic energy may be in the form of heat, light or sound.
 - *The speed and kinetic energy of a moving object on a ramp can be increased by:
 - 1. Increasing the angle of the ramp.
 - 2. Increasing the mass of the object.
 - Some of kinetic energy in Newton's cradle changes into other forms of energy such as sound energy and thermal energy.

In the Assessment Book:
Try to answer:
Mode: Exam on Thema 2

Model Exam on Concept (2.3)



(A) Choose the correct answ	wer ·	(> marks)
1 When a car stone guidden	ly, the passengers move	
a, backward	b. downward.	
C unward	d. forward.	
2 The two factors affecting t	the kinetic energy of an object are of	
this object.	Ale Milode offers	
a. light and sound energie	es.	
b. mass and color		
c. mass and speed		
d speed and color		
3 If an object moves down a	along a ramp, as the angle of the ramp increas	es the
speed of the object will	1. N. D. C.	
a. increase.	b. not change.	
c. become zero.	d. decrease.	
4. As the mass of a vehicle	increases, it needs to move, so to get .	
a. less force - less kinetic	energy.	
b. less force - less poten	tial energy.	
c. more force - more kine		
d. more force - more pote	ential energy.	
(B) Give a reason for the fo	llowing:	
The speed of the ball inc	creases when the cricket bat hits it hardly.	
2 (A) Put (V) or (X):		(5 marks)
 Some of kinetic energy of 	f balls in Newton's cradle is changed during co	llisions
into sound and thermal e		()
2. Speed = Time + Distance		()
3. After car collision, the air	bags deflate as fast as they inflate.	()
4. We cannot create new e	nergy, and also we cannot destroy existed ener	:gy.()
(B) What happens if ?		
Two bicycles move in o	pposite directions collide with each other.	
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	****** ***** ** **

correct the underlined words :	
(A) Correct the underlined words : 1. All moving objects always have light energy.	(5 marks)
Kinetic energy of an object doesn't depend on its speed which potential energy.	
 The number of moving balls of Newton's cradle must be more moving at the other side. 	-
 As the mass of a car increases, the damage that occurs during decreases. 	
(B) Arrange the following sentences to show the steps of collicated balls in the correct order:	
() Potential energy of the first ball decreases and changes in	oto kin er
() rations strong to transferred from the first ball to the rest	of balls
() Kise up the first ball, so it stores potential energy	
() Kinetic energy of all balls decreases gradually until they s	ton
	nop.
(A) Write the scientific term of each of the following:	
(A) Write the scientific term of each of the following: 1. A heavy steel ball that swings on a cable and used in destruction buildings.	(5 marks) ction of parts of
(A) Write the scientific term of each of the following: 1. A heavy steel ball that swings on a cable and used in destruction.	(5 marks) ction of parts of () her including an
 (A) Write the scientific term of each of the following: 1. A heavy steel ball that swings on a cable and used in destruction buildings. 2. The process in which two objects or more crash into each of energy transfer. 3. They are present in car airbags and allow them to deflate. 	ction of parts of () her including an ()
 (A) Write the scientific term of each of the following: 1. A heavy steel ball that swings on a cable and used in destruct buildings. 2. The process in which two objects or more crash into each of energy transfer. 3. They are present in car airbags and allow them to deflate fast after collision. 4. The energy that can be heard and usually produced when two 	ction of parts of () her including an ()
 (A) Write the scientific term of each of the following: 1. A heavy steel ball that swings on a cable and used in destructional buildings. 2. The process in which two objects or more crash into each of energy transfer. 3. They are present in car airbags and allow them to deflate fast after collision. 	ction of parts of () her including an () ()



SCIENCE

Assessment Book

By A Copy to Eugline 19

Content

THEME TWO: Matter and Energy THEME ONE: Systems **UNIT ONE: Living Systems UNIT TWO: Motion** Starting and Stopping: Adaptation and Survival: Concept - Self-Assessments - Self-Assessments Concept from (23) to (27) _____37 -43 from (1) to (6) _____5 - 11 2.1 - Model Exam - Model Exam on Concept (2.1) _____ 44 -45 on Concept (1.1) _____12 - 13 Senses at Work: **Energy and Motion:** - Self-Assessments Concept Concept Self-Assessments from (7) to (11) _____14 - 19 from (28) to (32) ___46 -51 1.2 - Model Exam on Concepts - Model Exam on Concepts (1.1) & (1.2) __ _ 20 - 21 (2.1) & (2.2) _____ 52-53 Light and Sight: Energy and Collisions: Concept Concept Self-Assessments - Self-Assessments 54 - 60 from (12) to (17) ____22 - 27 from (33) to (37) _____ - Model Exam on Concepts - Model Exam on Theme (2) _____ 61 -62

Concept

Communication and Information Transfer:

1.4

- Self-Assessments from (18) to (22) 30 - 34

This Assessment Book

Includes Three Parts

Part

Self-Assessments:

include:

1

- Cumulative self-assessments on lessons of each concept.
- Cumulative model exam on concepts.
- A model exam on each theme.

(Page 3)



Part

Final Examinations:

Include:

2

- El-Moasser final examination models.
- Final examinations of some governotates

(Page 63)



Part

Projects

Include:

- 3
- Unit one project.
- Interdisciplinary project.
- Unit two project.

(Page 101)





Self-Assessments



Self-Assessments

on Concept (1.1)

(A) Choose the correct answer:

Self-Assessment 1 On Lesson 1

1. Which of the following statements is correct r		
 Starred agama lizard live in extreme cold weather. 		
b. Penguins have no feathers on their feet.		
c. Forest bears blend in with snow throw their white fur.		
 d. Caracals have colorful scales to adapt their desert landscapes. 		
2. The different colors of fur in different types of bears help them to		
a. respire in their environments.		
b. adapt their habitats.		
c. communicate with other animals.		
d. look for shade areas.		
3. Which of the following sentences doesn't represent the camouflage adaptation?		
a. Dense feathers of penguins.		
b. White fur of polar bears.		
c. Colored scales of some lizards.		
d. Sandy-colored fur of fennec foxes.		
(B) Give a reason for the following:		
Some types of lizards that live in rocky areas have colorful scales.		
O DOMESTIC AND THE DESCRIPTION OF PROPERTY OF THE PROPERTY OF		
2 (A) Put (V) or (X) :		
 Bodies of fennec foxes, penguins and caracals are adapted to live in extreme hot climate. 	(}
2. Penguins have special blood vessels in their feet that help them survive	`	,
in polar regions.	()
3. The brown fur of the polar bear helps it to blend in with snow.	()
(B) What happens if ?		
Forest bears are coated with white fur.		

1. Which of block	the opposite figures, then answer the figure shows the correct structure od vessels in the penguin's feet? would happen if the penguin has	e questions below :	
the sti figure	ructure of blood vessels shown in (a)?	Figure (a)	553
***********		rigule (a)	Figure (b)
	Self-Assessment 2	till Lesson 2	
(A) Com	plete the following sentences:		
	fur of polar bear is considered as nec fox is considered as		e the panting
	eleon puffs up its body with air for det adaptation, while its V-shaped fe ation.		
	uflage in fennec fox takes place throu bear camouflage takes place through		
(B) What	happens if ?		
Bull st	hark has white back and dark belly.		
**** *****		Mark Market Mark	
2 (A) Corr	ect the underlined words:		
1. Arctic	fox has extra-large ears that help it st	lays warm.	()
2. Bull s	hark can live in salt water only,		()
3. Lizaro	ds are from mammals that are an anci	ent type of animals.	()
	e the scientific term of each of the fo	-	
1. It is a	change in the behaviors or acts of a live	ving organism to survive	. (
	perty that helps animals to blend in wi	th their surrounding	1
	onments.		(*************************************
3. It is a	change in the body structure of a livir	ng organism to survive.	(

Give two examples of animals which their bodies are covered by brown fur and
mention the importance of this fur for each of them:
1. • First animal is
Brown fur helps it to
2. • Second animal is
Brown fur helps it to
Self-Assessment 3 till Lesson 3
(A) Choose the correct answer:
1. All of the following are from the characteristics of kapok tree except
a. large leaves.
b. hand-shaped leaves.
c. buttress roots.
d. yellow seeds.
Among animals that have camouflage adaptation to hide from their predators are
a. penguin and polar bear.
b. polar bear and bats.
c. polar bear and panther chameleon.
d. panther chameleon and penguin.
3. Wide leaves are considered as adaptations of wetland plants to
a. search for water below soil surface.
b. get large amount of sunlight.
c. keep animals away from plants.
d. resist the water waves.
(B) Give a reason for the following:
The shape of pine tree leaves is like a needle.
(A) Complete the following sentences :
The branches of tree grow and gather on the top of its trunk to prevent animals from eating them, while has tan-colored coat that provides camouflage in sandy rocky environment.

 Both of arctic fox and pine tree survive in habitat, while both of panther chameleon and kapok tree survive in habitat.
3. The thick fur coat helps fox hunts in deep snow, while the blood
movement in the feet of keeps its toes from freezing.
(B) Just as we send messages via mobile, so some types of trees send messages through the wind.
Mention the name of two trees that can send messages through the wind.
3 Look at the opposite figure, then answer the following questions :
1. Give two examples of animals that live in this habitat.
2. Give two examples of plants that live in this habitat.
3. Put (🗸) or (X) :
Plants of this habitat are characterized by having long, thick roots.
2. Plants of this habitat have large, vade leaves. (
2. I land of this habitat have targe, singer transcor.
Self-Assessment 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
(A) Choose the correct answer :
1. The trunk in acacia tree stores as the hump in the camel stores
a. oil, water. b. water, milk. c. oil, milk. d. water, fat.
2. All of the following sentences are correct about stomach, except
a. it has teeth and tongue.
b. it receives the food from esophagus.
c. food changes into soupy liquid inside it.
d. it contains an acid.
3. All of the following organs belong to the respiratory system, except
a. nose, b. two bronchi, c. two lungs, d. stomach.
(B) Give a reason for the following :
Saliva is very important in your mouth.
the contract of the contract o

2	(A) Put (🗸) or (X) :	
	1. Caracal and fennec fox can hide in the desert as they have white-colored	
	fur. ()
	2. Bodies of starred agama and panther chameleon are covered with scales. ()
	3. Digestion process begins in the stomach with the help of saliva. ()
	(B) What happens if ?	
	The small intestine was not supplied with blood vessels in the human body.	
-	Control to the superiors Vacuum that the superiors is a	-
E	Study the opposite diagram, then answer the questions. Knowing that through tube (A) air passes, while through tube (B) food passes:	
	1. Tube (A) represents the	-
	2. Tube (B) represents the)
	3. Tube (A) connects throat to the	
	4. Tube (B) connects throat to the	
	5. Tube (A) belongs to system, while tube	
	(B) belongs to system.	
	Self-Assessment 5 till Lesson 5	
7	(A) Choose the correct answer :	
Ī	1. Air is important for human, fish and a rolls because	
	a. it contains carbon dioxide gas the apportant for breathing.	
	b. it contains carbon dioxide gas that is important for digestion.	
	c. it contains oxygen gas that is important for breathing.	
	d. it contains oxygen gas that is important for digestion.	
	Cutting down rainforests, may help human to make furniture, but also may	
	cause disappearance of	
	a. starred agama. b. bull shark.	
	c. panther chameleon. d. polar bear.	
	3. All of the following living organisms need food and can get oxygen gas from air	
	to obtain energy, except	
	a. fennec fox. b. bull sharks. c. pine trees. d. humans.	
	(B) Give a reason for the following :	
	Air pollution is dangerous for humans, while water pollution is dangerous for	
	fish and humans.	

human and fish.	ompletely polluted, no longer organis	ms can live in it /
		·
(B) Write one animal and	one plant that live in each environr	nent of the follow
Environment	Animal	Plant
1. Desert :	***************************************	albilbrovoboaboaabb4/4>barozicarp9a,
2. Rainforest :	100000000000000000000000000000000000000	4411713344444147444417474444 737421
3. Polar region :		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
4. Salt water :	***************************************	=`0.004444×00.2460040.0000
1. Acacia tree :	f structural adaptation in each of	the following :
1. Acacia tree :		the following:
1. Acacia tree :		
1. Acacia tree :	sessment 6 till Lesson	
1. Acacia tree :	sessment 6 till Lesson	
1. Acacia tree :	sessment 6 till Lesson rd : izard – Salamander – Toad.	6
1. Acacia tree :	sessment 6 till Lesson rd : izard – Salamander – Toad.	6
1. Acacia tree :	sessment 6 till Lesson rd : izard – Salamander – Toad. i tree – Amphibian. hameleon – Kapok tree – Acacia tre	6

2] (A) Write the scientific term of each of the following :	
1. A type of living organisms that can breathe in air and in water.	(
An organ with structural adaptation that enables toad to breathe in water.	(
The grassland habitat of acacia tree, in which we cannot found amphibians during dry seasons.	(
(B) If you are one of the scientists who help amphibians survive.	
You can do all of the following for their habitats, except	***
a. removing air pollutants.	
b. removing water pollutants.	
c. removing their natural predators.	
d. removing water from ponds and streams.	
(Give a reason for your choice)	

Look at the following two pictures, then answer the questions [by habitat (A) or habitat (B)]:	writing



Habitat (A)



Habitat (B)

- 1. Starred agama lizard and fennec fox live in
- 2. We can find panther chameleon in
- 3. Amphibians cannot live in
- 4. Yellow body coats is most common in
- 5. Dry seasons is more dangerous for
- 6. Cutting down forest usually occurs in
- 7. The suitable ecosystem for barbary fig Is
- 8. Caracal can live in
- 9. Arctic fox cannot be found in
- 10. Kapok tree can grow in

Model Exam

on Concept (1.1)

Iotal mark	
20	

			J
(A) Complete the f	ollowing sentences usin	g the words below: (5 mark	(s)
	(blood vessels – expa	nds – cool – mild)	
2. During exhalation3. Savannah is a gradum in the control of th	n, the diaphragm rassland habitat with a ne gills of fish carry oxyg or the following:	en gas to the rest of the body.	
	zard and golden frog are		
,			-
(A) Put (S) in front	of structural adaptation	and (B) in front of behavioral	_
The state of the s	each of the following s		ts/
 Bull shark can h 		-	
2. Black bear has	()	
3. Acacia tree used	S. ()	
Blood vessels in	()	
(B) What happens i	f ?		
One of the organ	s of the digestive syster	n is absent.	
	,	*********	
(A) Choose from	columns (B) and (C) wha	t suit them in column (A): (5 mars	ts,
(A)	(B)	(C)	
Living organism	Habitat	Way of breathing	_
1. Lizard	a. Land and water	A. Takes in oxygen from air only	,
2. Fish	b. Desert	B. Takes in oxygen from water only	
3. Frog	c. Water	C. Takes in oxygen from air and water	

	(B) Write the scientific term of each of the following:	Write the scientific term of each of the following:					
	1. Little air sacs surrounded by blood vessels in the respiratory system	n.					
		()					
	2. An animal changes its fur color between winter and summer seaso	ns,					
		()					
4	(A) Choose the correct answer:	(5 marks)					
	1. The stomach has an acid that helps in						
	a. crushing of food.						
	b. digestion of food.						
	c. absorption of digested food quickly.						
	d. absorption of water from undigested food.						
	2. Water lily has wide floating leaves to						
	a. prevent the loss of water. b. resist the water waves.						
	c. absorb a large amount of sunlight.						
	d. absorb a large amount of water.						
	3. All of the following living organisms live in desert, except						
	a. palm tree. b. pine tree.						
	c. starred agama lizard.						
	4. Amphibians absorb oxygen directly from water by their						
	a. skin. b. gills. c. lungs. d. nose.						
	(B) Correct the underlined words:						
	1. Gills are unique behavioral adaptation that allow fish to breathe						
	under water,	(
	2. Small intestine is a long muscular tube that moves food down into	, ,					
	the stomach.	(,,)					
		*					

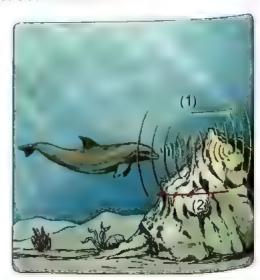
on Concept (1.2)

Self-Assessment 7 On Lesson 1

1. Dolphins use echolocation property that help them to		
(B) Give a reason for the following:		
Dolphins can locate their preys under water.		
 (A) Put () or (): 1. The owl uses the sense of touch to hunt its prey at night. 2. Fox has good senses of hearing and sight so that it can avoid danger. 3. A dog uses its sense of smell and sight to identify its pages. 	()
(B) Look at the opposite figure, then answer the feeting questions: 1. Mention the three senses that you use to identify the food in this picture.		Mille
2. What is the sense used to tell if this food has too much salt or not ? And which organ is responsible for it ?		
The second secon		

3 Observe the following figure, then choose the correct answer :

- 1. Arrow number (1) represents
 - a. sound waves produced by the dolphin.
 - b. the echo bounced back from the rock.
 - c. light waves produced by the dolphin.
 - d. light waves produced by the rock.
- 2. Arrow number (2) represents
 - a. sound waves produced by the dolphin.
 - b. the echo bounced back to the dolphin.
 - c. light waves produced by the dolphin.
 - d. light waves bounced back to the dolphin.



3	•	ses this property under water.	to				
	_		ourfoco				
		s above the water		•			
		0 0	anisms on the beach				
			anisms under water.				
4	. The sense us	ed by the dolphin	in the previous pict				
	a. smell.	b. taste.	c. hearing.	d. sight.			
			May despire the	The state of the second state of the state o			
		Self-Assessi	mant 8 till L	esson 2			
्री। (A) Choose the	correct answer :					
	. An animal tha	at flies and relies	on the bouncing of	sound to catch its prey i	S		
	a/an						
	a. owl.	b. snake,	c. bat.	d. dolphin.			
2	thing in com	phins are animals mon as they both same environmer	havenariand	nt in size, but they have	one		
	b. feed on th	e same prey.					
	c. depend or	n echolocation pro	perty in the an in	g.			
	d. depend or	n gills to breathe.					
	3. The Egyptian mongoose makes a group of sounds that						
	a. bounce back to it when it hits a wall or its prey.						
	b. is similar to the sounds made by dolphins and bats.						
	c. can be heard by tasting.						
	d. is the lang	guage of commun	ication with other m	ongooses.			
	(B) Give a reas	on for the follow	ring :				
	The nerves	spread across the	whole body.				
	*********			4141//////////////////////////////////			
	**************	*)**********************************	***************************************	946112007194411441441448); 0411184 11116544441			
	(A) D. (() a=	1W.					
Z	(A) Put (✓) or			It	1	١	
				Its prey through echo.	() \	
		rotate its head in		- - - - - - - - -	1	1	
	J. Nocturnal a	nimais decome a	ctive at morning to lo	OOK TOP (NEIF 1000).	,	1	

(B) Read the fo	llowing paragraph	n, then correct the w	nderlined words :
When you l through ser	near a fire alarm, th	hat means you have the eye, then nerves	received this information sent a signal to the heart,
***************	** ************************************	***************************************	
Place each of	uh. f. II	als in faces of the co	entence that describes it :
i lace each bi	_	Owis – Snakes –	
1can t	By but cannot see		-
	*	ed by the prey's bod	ly to hunt it at night.
		bowl-shaped faces.	
		n echolocation to find	
	,		
	Salf Accese	nent 9 till Le	CHADIN A
	Ocilewasessi	Hein a Miniae	Conocas
(A) Choose the	correct answer:		
1. The nervous	system of, s	such as elephants ar	nd dogs, consists of brain,
spinal cord a	nd nerves.		
a. rodents	b. birds	c. mammais	4 reptiles
2 can de bowls.	tect and amplify di	istant sounds due to	their neads that look like
a. Owls	b. Dogs	c. Mongooses	d. Chameleons
	your room, you car y using your sense		od is being prepared in
a, sight.	b. hearing.	c. touch,	d. smell,
(B) What happe	ens if?		
	s of jerboa are sho	rt.	
***************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
*******************	>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	111111111111111111111111111111111111111
(4) 6 4 4			
	underlined words		
-	reaction time is ve	¥	(
		elet and loud music d	lepending on your
sense of sigl		141 AI O	(
Nerves are a	n important part of	the digestive system	n. /

Animal (2) al by the heat produced from d on its large ears, which have age through a network of nerves to an example of a behavioral adaptation mple of a structural adaptation.
al by the heat produced from d on its large ears, which have age through a network of nerves to an example of a behavioral adaptation
d on its large ears, which have age through a network of nerves to an example of a behavioral adaptation
age through a network of nerves to an example of a behavioral adaptation
inan 4
ng, so that the animal
reproduce.
run away quickly.
ele in
damaged completely, this person's
rease. d. not change.
faster ? And why?

(A) Write the scientific term of each	of the followi	ng:
 The time taken by an organism's baround it. 		(
The type of impulses in which the inerves from the sensory organs to	information mo	essages transmit through
 Special type of nerves found in ser sending messages to the brain. 	nsory organs a	and responsible for ()
(B) A hunter was trying to catch a decay any noise or movement, so the decay	er but he was eer was escap	not being careful to not make ed.
In your opinion, what happened in escape?	the deer's ner	vous system that helped it to
3 Order the following statements that	illustrate hov	v the rabbit's brain processes
running away from the fox before p	redating it:	
() The rabbit's brain processes	s information.	
() The rabbit's nerves sent a s	ignal to the br	a'n.
() The rabbit's brain sent a sig	nal to its feet	muscles to escape.
() The rabbit saw a fox moving	towards it to	devour it.
Self-Assessme	nt (11) till	Lesson 5
(A) Choose the correct answer:		
When you see an orange falling fro could the brain process its signals	om a tree to the fast in this site	ne ground, which of your senses uation ?
a. Hearing, b. Touch.	c. Sight.	d. Smell.
 When your leg hits a rock while was in your leg send a message to you through the 	alking down in ir brain throug	a street, the sensory receptors h a network of nerves passing
a, esophagus. b. trachea,	c. lungs,	d. spinal cord.
3. Both dolphins and owls have share	p sense of ,	1041
a. sight. b. hearing.		d. touch.
(B) Give a reason for the following:	stant anumula -	
An owl can detect and amplify dis		
**************************************	4111147018411411111111111111111111111111	
		The state of the s

2 ((A) Correct the underlined words:					
1	The rely of bats on echolocation to find insects at night is considered as a behavioral edeptation.					
	as a behavioral adaptation.	()			
2	 When the echo bounces bac send a message to the hear 		ork of nerves, telling			
	it where its prey is.		()		
3	 A snake can locate a jerboa the jerboa's body. 	at night through	the <u>light</u> produced from ()		
(B) Circle the organism that had organisms:	as a sharp sense	of hearing from the following			
	1. Egyptìan jerboa.	2. Snake.	3. Bat.			
	4. Fennec fox.	5. Human,	6. Dolphin.			
	selected sentences into structural and behavioral adaptations by wr sentence number in the table below:					
	1. Its head is covered with fea	thers.	()		
	2. It is from reptiles.		()		
	3. It has a sharp sense of hea	()			
	4. It becomes active at night t	o catch its prey.	()		
	5. Its body is covered with sca	ales.	()		
	6. It turns its head in all direct	ions.	()		
	Type of adaptation	n	Sentence number			
	Type of adaptation Sentence number					
	1. Structural adaptation :	** ***				

Model Exam

on Concepts (1.1) & (1.2)

Total mark	
20	
-	

1	(A) Choose the cor	rect answer :			(5 marks
	1. The ability to ser	ise heat of the pre	eys' bodies is	a super sensory adap	tation
	a. bats.	b. snakes.	c. chameled	ns. d. owls.	
	2. The role of teeth				
	a. mixing the foo		b. crushing	the food.	
	c. swallowing the			g the food.	
	3. The super sense	of dolphin is the	sense of	***	
	a. smell.	b. sight.	c. touch.	d. hearing.	
	4. Palm tree has tin	y leaves like			
	a. pine tree.	-		e. d. water lily plan	nt.
	(B) What happens if	f ? short ears and le	as.		

2	(A) Put (V) or (X) :				(5 marks
	1. Hand-shaped lea	ives of kapok tree	is considere	d as a straictural	
	adaptation.				(
	2. The bones carry electrical impulse		sensory orga	ns to the brain in the f	orm of (
,	3. Amphibians inclu	de frogs, starred	agama and s	alamanders.	(
	4. The brain can pro	ocess what we he	ar slower tha	n what we see.	(
	(B) Cross out the oc				
	1. Nerves – Small i		- Spinal cord.	1	
	2. Stomach – Diapl			testine. (****** ******* ***
3	(A) Choose from co	lumns (B) and (C)	what suit th	em in column (A) :	(5 mark
	(A)	(B)		(C)	
	Living organism	Specie	es	Habitat	
	1. Bull shark	a. Reptile		A. Savannah	
	2. Starred agama	b. Amphiblan		B. Salt and fresh water	er
	3. Acacia	c. Fish		C. Wet environment	
	4. Frog	d. Plant		D. Desert environmer	nt

(B) Give a reason for the following:					
The spinal cord has an important function in the nervous syst	em.				
(A) Complete the following sentences using the words below:	(5 marks)				
(penguin - reflex - reaction time - oxygen ga	s)				
1. Moving your hand away when touching a very hot cup of tea is called					
2. Living organisms need food and to obtain energy.					
3. Among animals that can live in polar environment are and po					
Arnong animals that can live in polar environment are					
(B) Correct the underlined words :					
1. Fish use lungs to take oxygen out of the water.	()				
2. The spinal cord is the main control center in the body.	()				

on Concept (1.3)

IS	elf-Assessment 12 On Lesson 1				
(A) Put (V) or (X)):				
 Sensory receptors in eyes send electric impulses to the brain for information. 					
The membrane to detect the p	e that presents on the back of cat eyes depends on echo rey location.				
Fishing cat has	s excellent night vision better than human.				
(B) Give a reason	for the following :				
	hing cat has the ability to collect more available light at night				
	,				
44144444444					
(A) Choose from	column (B) what suits it in column (A):				
(ii) thouse from	Coldini (b) Wildt Suits it in Coldini (A).				
(A)	(B)				
1. Snake	a. has strong wings, that help it to fly.				
2. Fishing cat	b. can feel the warm of prey body at night.				
3. Human	c. has night vision better than snake and lower than fishing cat.				
	d. has a mirror-like membrane on the back of its eye.				
1	2				
(B) Read the follo	owing paragraph, then correct the underlined words :				
	ight needs super sensory adaptations in predators, such as				
sense of taste	e in fishing cat and sense of sight in bat, that are weaker that				
those in huma	an, so they can hunt at night.				
111074144- 3101111, 741 11	The state of the s				
	· · · · · · · · · · · · · · · · · · ·				

Choose the correct answer :

- 1. If the human eyes contain a mirror-like membrane like which is found in fishing cat eyes, so all the following statements are correct, except
 - a. human eyes seem to glow at night.
 - b. human eyes have excellent night vision.
 - c. human eyes don't need night vision goggles.
 - d. human eyes need a strong source of light to can see at night.

		aptation in their ea	ers to strong the sense	of		
hearing for them			d. snake.			
	b. arctic fox.					
3. Which of the follo	wing animals has t	he ability to fly but	can't see at night?	*******		
a. Owl.		c. Bat.	d. Fennec fox.			
4. All the following	have structural ada	aptation in their se	ense of sight, so it is s	tron	g	
except						
a. owl. b. fishing cat.						
c. panther cham	eleon.	d. bat.				
			M 11 415			
Se	II-Assessmer	nt 13 till Les	son 2			
(A) Choose the cor	rect answer :					
1. All of the following	ng are nocturnal ar	nimals, except	•••			
a. fishing cats.		b. bats.				
c. barbary fig.		d. tarsiers.				
2. The eyes can me	ove in their socket	s and the pupil is	not adapted to night			
a. tarsiers.	b. owls.	c. cats.	d. humans.			
3. The pupils of hu	man eyes open	that of noctur	nal animals.			
	b. narrower than					
(B) What happens	if ?					
	same structure of	nocturnal animal	s eves			
***************************************			5 0 y 0 3.			
(A) Put (V) or (X)						
1. If the human ha	s the same eye str	ucture of fishing o	cat, so he doesn't			
need night visio	n goggles to see ir	the dark.		()	
2. If there is a little	light in a dark root	m, you can see a	n object in this room			
when your eyes	adjusted to the da	irkness.		()	
3. There are some	similarities betwe	en owls and tarsle	ers in structural			
	eir eyes to the dar	KNOSS.		()	
(B) Give a reason t	_					
Nocturnal anin	nals can see better	than humans at i	night.			

	the following	ff Mords
Write the name of the animal in	n front of each sentence using the followin	a words !
	ng cat - Dolphin - Bat - Tarsier)	(
1. You can see its eyes glow at	night.	(
2. It uses echo to hunt fish.	ta Ma	(
3. It has the same structure of e	eye as owl but can't Tly.	(
The shape of its face collects	s and amplifies different sounds.	,
It flies at night and hunts by r	receiving echo bouncing off its prey.	()
Self-Assess	sment 14 till Lesson 3	
(A) Choose the correct answer	:	
1. All the following organisms ha	ave tapetum lucidum, except	
a. snakes. b. fishing ca	- d baraca	
_		
	that present in nocturnal animals.	
a. brain	b. nerves	
c. tapetum lucidum	d. blood vessels	
except	n all the following senses to find their prey sense. c. taste sense. smell sense.	at night,
(B) Give a reason for the follow		
Tapetum lucidum works like		
rapeturi lucidum works iiko	, d (31111-011	
2 (A) Put (✓) or (X):		
	ke membrane, so their eyes glow at night.	()
2. Pupils of eyes present in noc	cturnal animals and absent in humans.	()
3. In complete darkness, the ey	es of cats doesn't glow.	()
(B) Cross out the odd word:		
1. Owl – Fishing cat – Snake –	Tarsier.	()
2. Cat - Dog - Deer - Bat.		(
2. out		
If there is a wild cat moves arou	und in a forest at night. Choose the correc	answer:
	shine at night because it has	C CHILDRE
a. huge eyes.	b. tapetum lucidum.	
c. large ears.	d. long legs.	
2. All the following animals can		
a. tarsier. b. fishing ca	ot - Lat	
and the same of th	als the wild cat can't recognize it?	
a. Tarsier. b. Chamele		
a. jajoloi.	on, c. Snake, d. Jerboa,	

Self-Assessment 15 till Lesson 4

1	(A)	Put	(V)	or	(X)	
---	-----	-----	-----	----	-----	--

1.	You can	n see a green ball inside a transparent glass box.	()
-	-		

- Opaque objects allow light to pass through and we can see objects through them.
- In a completely dark room, we can see the transparent objects but opaque objects cannot be seen.

(B) Give a reason for the following:

You can see clearly through lens.

(A) Choose from column (B) what suits it in column (A):

(A)	(B)
1. Water 2. Glass 3. Wood	 a. It is an opaque material, that reflects light in different directions. b. It is a source of light energy. c. It is a transparent material that is used in making windows. d. It is a transparent liquid material.

(B) Cross out the odd word:

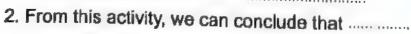
- 1. Mirror Cloth Paper Brick.
- 2. Wood door Book Wall Glass cup.

(.....)

١

Look at the opposite figure, then answer the questions below:

 Can you see the light from another side of cup?



- a. water and glass are opaque objects.
- b. water and glass are transparent objects.
- c. water is an opaque object, while glass is a transparent one.
- d. glass is an opaque object, while glass is a transparent one.



Self-Assessment 16 till Lesson 5

	(A) Complete the following sentences: 1. The Moon doesn't emit its own light, but it the light falling on it. 2. Plastic, wood and paper reflect		
	(B) What happens if ? You place an opaque object between a light source and a wall.	*4 41 v	,
	(A) Put (V) or (X): 1. In complete darkness, noctumal animals depend on sense of sight to move avoid predators.	and (d)
	 Tarsier has huge head like owl to gather and reflect any light. Things cannot be seen through transparent objects. 	()
	(B) Give a reason for the following: The pupils of cat eyes open wider than the pupils of human eyes.		
3	Give one example of each of the following :		
	1. Smooth surface : 2. Transparent object : 3. Rough surface :	\$ 121 m 4 h	
	4. Opaque object :	· 家庭有少學者	
1	 (A) Put (V) or (X): The light reflection depends on smoothness of the object's surface. Both of tarsier and fishing cat can turn their heads 180 degrees. Cats have excellent night vision, while snakes and bats are not. (B) What happens if ? 	((
	The structure of fishing cats eyes is the same like humans.		,

(A) Write the scientific	term of each of the following :	
1. The organ that is resp	consible for processing information rece	ived
by eyes, to know and	recognize the surroundings.	(
2. A species of wild cats	whose eyes glow at night.	(
3. A type of surface that	reflects light in different directions.	(,
(B) Give a reason for th	e following :	
Bat can find its food	at night although it has a weak sense o	of sight.
Choose the correct ans	wer:	. ,
1. If there are two sheet	s, one is made of wood and the other is	s made of
glass,		
a. you can see the gla	ass sheet through the wood sheet.	
b. you cannot see the	e wood sheet through the glass sheet.	
c. you can see the wo	ood sheet through the grass sheet.	
d. light can pass thro	ugh both sheets.	
2. Each of human, fishir	ng cat and tarsier,	
a. has an excellent ni	ight vision.	
b. becomes more act	ive at night.	
c. has a mirror-like m	embrane in eyes.	
d. has two eyes adap	eted for vision.	
3. Mirror causes falling	light rays to	
a. pass through it.		
b. reflect at the same	angle they strick the mirror.	
c. reflect in different (
d. diffuse like that of	rough surfaces,	
	eyes open that of nocturnal anim	nals.
a. typical to	b. narrower than	
c. wider than	d. similar to	

Model Exam on Concepts (1.1), (1.2) & (1.3) (A) Answer the following questions by using the words below: (Human - Fishing cat - Owl - Chameleon) 1. Which of them can make camouflage adaptation? 2. Which of them has tapetum lucidum layer? 3. Which of them can move its head in all directions to see its prey? 4. Which of them can use night vision goggles to see at nighttime?

(A) Choose from column (B) what suits it in column (A):

Diaphragm plays an important role in respiration process.

(5 marks)

Total mark

20

(5 marks)

(.

(.....

(A)	(B)
1. Fishing cat	a. has poor night vision, so it depends on feeling the heat of prey's body.
2. Owi	b. lives in water and depends on the so that bounces on prey's body.
3. Bat	 c. has poor night vision, so it depends on the sound that bounces off prey's body.
4. Snake	d. has excellent night vision and its eyes glow at night.e. has extraordinary sight at night and bowl-shaped face.

		2	A
4	2	J	4
	_		

(B) What happens if ... ?

The polar bear has a thin fur instead of its thick fur.

(A) If there is a small green lizard in a place with weak light levels.

(5 marks)

Answer the following questions:

(B) Give a reason for the following:

- 1. Which of the following animals can see and hunt it ?
 - a. Bat.
- b. Snake.
- c. Tarsier.
- d. Dolphin.
- 2. Which of the following living organisms can hear its quiet movements and hunt it ?
 - a. Snake.
- b. Owl.
- c. Dolphin.
- d. Human.

	If this green lizard completely. Which		some green leaves living organisms car		*******	
	a. Fishing cat.	b. Human.	c. Tarsier.	d. Snake.		
	(B) Put (✓) or (X):					
	1. All living organism	ns need food and	oxygen gas to get e	energy.	()
	2. The membrane the present in other of		e back of a fishing o	cat eyes doesn't	()
	3. Animals can't eat	barbary fig due to	its sharp spines.		()
4	(A) Write the scient	ific term of each	of the following:		(5 ma	erks)
	1. A device that hur	nan can depend	on to see in the dark	k. ()
	2. It is a characteris			vive and		,
	•	ecosystem in wh		`		ĺ
	3. It is time taken b	y a jerboa's body	to react to danger.	()
	4. Objects that don	't allow light to pa	ss though.	()
	(B) Correct the und	erlined words:				
	1. The brain is a pa	ort of the respirato	ry system.	()
	2. Nocturnal anima	Is have smaller e	yes than humans.	()

on Concept (1.4)

Self-Assessment 18 On Lesson 1

4	(A) Put (✓) or (X):			(
	1. Fireflies form differen	ent flash patterns l	by using their legs.	
	0 0 11 1 11	1	Sada with neuple.	\
	 Speaking is the on Using flashing LED 	lights to imitate th	ne fireflies patterns i	s an example of
	the interaction bety	veen humans and	nature.	1
	The wings of firefli	es play an importa	nt role in the commi	unication between then
			ID II DICATIFA CAMENTOSA ADA CAMENTI	**** *******
	44111	***************************************	otto regions arestopististest strong	***************************************
	4 ** ** *******************************			
2	(A) Correct the unde	rlined words:		
	1. Changing the flash	patterns of fireflie	s is considered	1
	as a structural ada	ptation.		(
	2. A cell phone is a de	evice that is used in	n communication	(
	between animals.			***************************************
	3. Reading is a type	of communication t	hat depends on	(
	the sense of taste.			o wittenach other?
	(B) How can fireflies	insects produce i	ight to communicat	te witte aach other?

			4475 1 110 00010	
2	Choose the correct	answer:		
	4 Roth humans and	animals can use a	all the following type	es of communication,
	except wh	ich are used by hu	imans only.	
	a. sounds	b. lights	c. movements	d. cell phones
		wing is not a reaso	on for fireflies produ	ce a flash light?
	a, To attract a ma		b. For communic	
	c. To warn off pre-		d. To hear in the	
	3 is conside			
		b. Echolocation	c. Reading	The second secon
	a. Writing		_	d. Cell phone
	4. A firefly is not a b	b. lizards.		
	a. amphiblans.	D. IIZATUS.	c. beetles,	d. reptiles,

Self-Assessment 19 till Lesson 2

(A) Choose the	e correct answer :	s use the sense of	hearing to communicat	e wit	h
	except	is use the abiles of	•		
	b, whales.	c. fireflies.	d. bats.		
2. Some living	organisms can use	light energy in com	munication such as		
a. whales.		c. dolphins.	d. snakes.		
	s the only living orga ite with each other.	anism that can use	language and speech t	0	
a. whale	b. owl	c. firefly	d. human		
(B) Give a rea	son for the followir	ng:			
The hump summer.	back whales produc	ce low-pitched soun	ds during feeding seas	on in	****
2 (A) Put (V) or	r (x) :				
•			iring summer season.	()
		ition from a used by	human only.	()
•	le for a human to inf			(,
(B) Mention to		animals that use s	ound energy in their		
		erent songs as well n their songs in win	as the human singers. ter and in summer. (concerning soun	d pita	 ch)
2. If you kno a) Do you	w that both of hump	back whales and do k and dolphins can		,	
**************	4	s that they respire 1			

Self-Assessment 20 till Lesson 3

(A) Compl	ete the f	allowing	Sentences :	
1. Morse	ode can	depend o	on the sense of	or
				ense of in communication.
		_	_	energy for communication.
(B) What h			are depend on	Gitosgy
			d according to the	communication of humpback whale
********			according to the	
(A) Correct	t the und	lerlined v	vords :	
		dashes	and question mar	ks, that represent different letters
the alph				(,
	ter month	is are co	nsidered as the fe	eding season for humpback
and and a				
whales				
3. Both Me		ene e no	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(۔۔۔۔۔۔۔۔۔۔۔ عند ماہ کے عام (smell in
3. Both Me	ication.			ात । हैन । अ of <u>smell</u> in
3. Both Me commun (B) Mentio	n two typ	pes of en	ergy that Morse o	on the sea of smell in
3. Both Me commur	nication. n two ty	pes of en	ergy that Morse o	code depends on them.
3. Both Me commun (B) Mentio	n two typ	pes of en	ergy that Morse o	code depends on them.
3. Both Me commun (B) Mentio	n two ty	de in from	ergy that Morse o	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How can	n two ty	de in from	ergy that Morse o	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How car name us	Morse coo	de in from N rite his se code ?	ergy that Morse of the of you, Mona contact A	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How can	Morse co	de in from	ergy that Morse o	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How car name us	Morse coo	de in from N rite his se code ?	ergy that Morse of the of you, Mona contact A	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How car name us R	Morse coo	de in from N vrite his se code ?	ergy that Morse of the of you, Mona control of Y	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How car name us R 2. How car	Morse cooking Morse A you write	de in from N vrite his se code ?	ergy that Morse of the of you, Mona control of Y	an write her name as follows:
3. Both Me commun (B) Mentio Based on M M 1. How car name us R	Morse cooking Morse A you write	de in from N vrite his se code ?	ergy that Morse of the of you, Mona control of Y	code depends on them.
3. Both Me commun (B) Mentio Based on f M 1. How car name us R 2. How car	Morse cooking Morse A you write	de in from N vrite his se code ?	ergy that Morse of the of you, Mona control of Y	an write her name as follows:

Self-Assessment 21 till Lesson 4

(A) Choose from column (B) what suits it in column (A):

	(A)	(B)	
	1. Fireflies	a. depend on the sense of smell in their comm	nunication.
	2. Humpback whales	b. depend on the sense of taste in their comr	nunication.
	3. Ants	c. depend on the sense of sight in their comm	nunication.
		d. depend on the sense of hearing in their co	mmunication.
	1 2	3	
	(B) Give a reason for t	he following :	
	Hikers always take r	nirrors with them during their travelling.	
	P4850037802000000000000000000000000000000000		PP4 44474754444775557444474
2	(A) Write the scientific	term of each of the following:	
		s symbols in a pattern and their arrangement	
	form a word with a n		()
		akes a movement in iigure-eight pattern in	()
	communication.	and all battern in	()
	3. It is a pattern that ha	as meaning.	()
		of two insects that use the sense of sight to	
Ì	with each other.	or the insects that are the selise of sight to	Communicate
	************************	***********************************	
2	Donald 5 th		
2	kead the following pa	ragraph, then answer the questions:	
	his family from	ed of father, mother and one child. Father alv	vays protects
	family. Sometimes the cheese left in the fridge	ernal danger . Mother goes to the market to b child warns his mother that there is only a sm e.	uy food for the all place of
	- According to your stu-	dy to the life of ants. Complete the following se in the previous paragraph represents each of	ntences to the following:
	a represents		
	b represents		
	crepresents	the soldier ant.	

Self-Assessment 22 till Lesson 5					
 (A) Complete the following sentences: 1. Both of the special cane of a blind person and humpback whales during producepitched sound during communication. 	the following sentences: special cane of a blind person and humpback whales during winter pitched sound during communication.				
The special cane of a blind person depends on sense while fireflies depend on sense in communication. High and high the fireflies in Morro code.					
3. Light can be used instead of in Morse code.					
(B) Give a reason for the following: People use signal fires.					
People use signal fires.					
2 (A) Put (V) or (X):					
 The special cane of a blind person is like humpback whales in that both use echolocation. 	or them				
Both honeybee and ant depend on the sense of smell in their communication.	(
 According to Morse code we can use light energy and sound ∈ ∈ gy in communication. 	(
(B) Mention two living organisms that use smelly messages in there communication.					
	42+1444 *****				
B Look at the following photos, then answer the questions :					



Fig. (1) Night-vision goggles



Fig. (2) Blind person's cane

- 1. Device in figure (.....) is used to help people to see in low light areas.
- 2. Device in figure (......) is used by blind people.
- 3. Device in figure (.....) is inspired from bats.
- 4. Device in figure (.....) is inspired from cats.

Model Exam

on Theme (1)

To	otal mark	
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	20	
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1

(A) Choose the correct answer:	(5 marks)
The presence of thick white fur is a structural adaptation in a. fennec fox. b. starred agama lizard.	a.u.
c. forest bear. d. polar bear.	
To describe the bag color of your friend, you should use the ser a. taste, b. sight, c. touch, d. smell,	nse of
 3. The fishing cats eyes glow due to the presence of	world.
weaved around each other. (A) Put (V) or (X):	(5 marks)
1. The starred agama lizard blends in with big green trees in its	environment to
hide from its enemies.	()
 The sense of hearing of dolphins is stronger than that of huma Humans and most of animals depend on sight sense to see 	an. ()
the surroundings.	()
4. Speaking is the only way of communication between people.	()
(B) Cross out the odd word:	
 Palm tree – Cactus plant – Mangrove tree – Barbary flg. 	() ()
Brain – Spinal cord – Nerves – Lungs,	()

3	(A) Complete the following sentence	oe '	13 marks)
	Huge eyes of owls and help vision	them to gather more light to	
	A group of fireflies can change the group of fireflies to communicate.		
	All living organisms breathe in oxy product.		
	4. Echolocation property is used by t	oats and to locate their prey	5.
	(B) Give a reason for the following: Gills are unique structural adapta		
4	(A) Write the scientific term of each	of the following:	(5 marks)
	1. An animal that can sense the body a special has colingrad.	y heat of its preys at night, by usin	()
	2. The visible factor of energy, that en	ables us to see.	()
	3. The season in which the humpbac	k whale produces low-patered sou	und. ()
	4. A large muscle in the human body relaxes during breathing out.		(
	(B) If you know that the color of des adaptation:		a structural
	How does this adaptation help jer	boa to survive ?	
	*****	or mansar sunaumas an a commission o	
		194(D)((D4()) (H)) (194) WO((((((((((((((((((((((((((((((((((((
		(41))(1) (1) (1) (1) (1) (1) (1) (1) (1) (
			TIPSERS SPACE

on Concept (2.1)

Self-Assessment 23 On Lesson 1

) Choose from colum	n (B) what suits it in column (A):
(A)	(B)
 Normal engine Jet engine Parachute 	a. is used in stopping both of the shockways. In the and rockets. b. is used in the angle normal truck. c. is used to stop a normal truck. d. is used in moving the shockwaye truck.
1 3) Which is faster, a n (Give a reason for	2

Self-Assessment 24 till Lesson 2

(A) Choose the correct answer:	
. , vac are correct unatter (force.
(A) Choose the correct answer: 1. The force that acts on the table to stand on the ground is	
a. only pulling gravity	
b. only pushing gravity	
c. unbalanced pushing and pulling gravity	
d. balanced pushing and pulling gravity	rd due to the
2. The jet engines in the shockwave truck make it moves forward	ru, due to the
acting on it.	
a, pulling force only	
b. pushing force only	
c. both pulling and pushing forces	
d. the Earth's gravity force	
3. We can see all the following motions except	
a. the rotation of Earth around the Sun.	
b. a person crossing the road.	
c. a person riding a bicycle.	
d. a person swimming in the sea.	
The pulling force of one of the two teams in tug-of-war game	becomes grea
B) What happens if ? The pulling force of one of the two teams in tug-of-war game than the other team.	becomes grea
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words :	e becomes grea
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: We can stop the motion of the shockwave truck by using	
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: We can stop the motion of the shockwave truck by using fire extinguishers.	
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: We can stop the motion of the shockwave truck by using fire extinguishers.	(
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: We can stop the motion of the shockwave truck by using fire extinguishers. In tug-of-war game, the winner team is the team with the weathers.	(
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: We can stop the motion of the shockwave truck by using fire extinguishers. In tug-of-war game, the winner team is the team with the weathers. You can stop the ball that is thrown towards you by the pulling force of your hands against the ball.	(
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: . We can stop the motion of the shockwave truck by using fire extinguishers. . In tug-of-war game, the winner team is the team with the weak. You can stop the ball that is thrown towards you by the pulling force of your hands against the ball.	(
The pulling force of one of the two teams in tug-of-war game than the other team. A) Correct the underlined words: . We can stop the motion of the shockwave truck by using fire extinguishers. 2. In tug-of-war game, the winner team is the team with the weathers.	(

B Look at the following figures, then choose the correct answer:







Figure (2)

- 1. The force (s) used in figure (1) is/are
 - a. pushing force only.
 - b. pulling force only.
 - c. both pushing and pulling forces.
 - d. neither pushing nor pulling force.
- 2. The force(s) used in figure (2) is/are
 - a. pushing force only.
 - b. pulling force only.
 - c. both pushing and pulling forces
 - d. neither pushing nor pulling force
- 3. The winner group in the game of figure (2) is the group that has force that of the loser team.
 - a. more than
- b. less than
- c. equal to
- d. weaker than

Self-Assessment 25 till Lesson 3

1	(A)	Complete	the	following	sentences	
---	-----	----------	-----	-----------	-----------	--

- 2. You cannot lift up a bag from the ground if the pulling force of your hand and the force of gravity are
- 3. When you stop pedalling during the movement of the bicycle, its speed decreases gradually until it stops, due to the effect of force.

(B) Give a reason for	the following	1
-----------------------	---------------	---

When you let the ball out of your hand, it falls to the ground.

② (A) Put (✓) or (x):			diama Alaa
The shockwave truck has only one jet engine to normal truck.			
 2. The reason for stopping a toy car moves on a the toy car and the table surface. 3. To move up any object from the ground, the pube smaller than the pulling force of the gravity. (B) Mention two forces act on a moving car and movement. 	ulling	g ford	ce of your hand must
3 Look at the opposite figure that shows the mov your hand, then answer the questions :	eme	ent o	f a ball pushed up with
(A) Put (✓) or (×):			
(A) Put (v') or (x):1. The ball moves from point (1) to point (2) due to the hand pulling force.	()	3
 The ball moves from point (1) to point (2) due to the hand pulling force. The ball moves from point (2) to point (3) due to the gravity pulling force. 	()	
 The ball moves from point (1) to point (2) due to the hand pulling force. The ball moves from point (2) to point (3) due 	()	3

Self-Assessment 26 till Lesson 4

🚹 (A) C

(A) 1. Friction force 2. Balanced forces 3. Unbalanced forces	(B)				
	a. are the forces that act on any object to make it moves.				
	b. is the force that act in the opposite direction of the object's movement to stop it.c. is the force that act in the same direction of the object's movement to stop it.				
					d. are the forces that act on any object that does not move.
1	2				
Give a reason for the fo	Sowing:				
f a ball moves on the gr	ound, its speed decreases till it stops.				

2	(A) Write 1	the scient	ific term of	each	of b	 subterving 	1
---	-------------	------------	--------------	------	------	--------------------------------	---

- 1. The type of force that is used in tug-of-war game. (.....)
- 2. It is the force that causes any object falls down toward the ground.(.....)
- 3. It is the engine that is used in the shockwave truck to allow it moves fast.

(B) What happens if ...?

A car and a truck are affected by the same pushing force.

B Look at this picture, then complete the following sentences:

- 1. The car moves as a result of force that is applied by the boy.
- 2. During the movement of the car, it is opposed by a friction force of and a friction force of
- 3. Friction force causes to the speed of the car.
- 4. If the car is pushed by a stronger force, it will move for a distance.
- 5. If this car is replaced by a bigger one, it will need a more force to move the same distance.



Self-Assessment 27 till Lesson 5

(A) Choose the correct answer:							
1. When one of two toy cars moves faster than the other, t	his means that this toy						
car do work that of the other toy car.							
a, more than b, less than c, equal to d.	half to						
2. The reason for stopping a toy car craches the wall is the	3						
a. pushing force of wall in the opposite direction of the o	ar movement.						
	b. pushing force of wall in the same direction of the car movement.						
	c. pulling force of wall in the opposite direction of the car movement.						
d. pulling force of wall in the same direction of the car m							
3. In tug-of-war game, if the first group contains three child							
group contains nine children, this means that the forces							
of each other.							
a. balanced in opposite direction b. unbalanced in op	posite direction						
c. balanced in the same direction d. unbalanced in the	e same direction						
(B) Give a reason for the following:							
Any body moves on the ground is usually affected by a	force opposes its						
direction of movement.							
***** ************* * **************** *	//******* **! *** *** *** *******						
2 (A) Correct the underlined words :							
1. The reason for standing of a cup on a table is that the p	oushing force of the table						
is more than the pulling force of gravity.	()						
2. The work done by the football is always less than the a	mount of energy						
transferred from the player foot to the ball,	()						
3. If the same force is applied on a large ball and a small I	ball, the large						
ball moves a distance longer than the small ball,	(11.15.11.15.15.15.11.15.11)						

(B) In the opposite figure, if we affect on these two toy cars by the saw (A) (B) moves for a longer distance than	ame force :
the car (A)?	0 m
***************************************	B = 50
The pharaohs built the pyramids, and this work took many years of	work :
(A) Find out from the picture :	
Two persons pull the heavy stone.	()
2. Two persons push the heavy stone.	()
The type of force between the stone and the ground.	()
(B) Put (✓) or (X):	
 If the large stone moves from its place, this means that there are ba forces acting on it. 	lanced
2. Big stones need more force to move them than smaller ones,	()
The work done is equal to the amount of energy transferred by a ferror of the second sec	()
that is used to move the stone.	()

Model Exam

on Concept (2.1)

total Mal	k
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20	ı
	ı

	(A) Choose the	correct answer:			(o ma	irks)	
	1. What force of	lo you use to kick	a ball with your leg	?			
	a. Pull.	b. Push.		d. Light.			
	2. When an ob	ject is in motion, t	his means that its	changes.			
	a. color	b. shape	c. size	d. position			
	3. Which of the		ise an object to mov	e ?			
	a. Balanced		b. Unbalanced				
	c. Sound end	ergy.	d. Light energy	/ .			
	4. Which sentence represents the best example of gravity?						
	a. A car hits	a tree, and its mo	tion stops.				
	b. A wind blo	ws, and a sailboa	it moves.				
	c. A book is p	oushed, and it mo	ves across a table.				
	d. A person o	frops a ball, and if	t falls to the ground.				
	(B) What happe	ens if ?					
	The shockw	ave driver opens	the parachutes.				
			1110				
	***********		4				
_							
	(A) Put (✓) or (- h	(5 ma	rks)	
			nore energy than pus		(,	
	2. You need energy to push a car forward or backward.						
	3. Using a remote control of television needs a pushing force that acts						
	buttons.	arshes into a wal	Lit will not stop		(,	
					(,	
		on for the followi					
	The shockw	ave truck is faster	r than the normal tru	ck.			
		,////*********************	. #99 >44171111111111111111111111111111111111	****************************			
	************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
		ne following sent	ences :				
3]	(A) Complete in	e by a basketball	is equal to the amo	timb of	(5 mai	rks)	
	The work done by a basketball is equal to the amount of transfe from the player hand to the ball.						
	If the same n	ulling force acts o	n two boxes, and on	in of them.			
- 4	Z. II the same P	aller box will move	e for a dista	o of uleril is larger	than the	,	

other, the smaller box will move for a distance.

When you lift up an object from the groun are the force of your hand and							
4. We can say that the object is in motion re	elative to a point.						
(B) The following figure shows two similar answer the questions below:							
	Which of these two cars is affected by a greater force ?						
(Give a reason for your answer).	Original position						
	70 cm						
(A) Write the scientific term of each of the	e following: (5 marks)						
1. A force that you make to change the dire	ection of an object towards you.						
A force that you make to change the dire from you.	ection of an object away ()						
It is a push or pull that is applied to an oits position.	ুহুৱা causes it to change ()						
4. It is a force that is exerted when $ob_{j^{\prime\prime}}$	against each other. ()						
(B) Look at the opposite figure, then ansv	ver the following question :						
In the opposite figure what happens if	we increase						
the number of fire extinguishers fixed o							

on Concept (2.2)

Self-Assessment 28 on Lesson 1

1	(A) Choose the correct answer:							
	1. The roller coaster moves up the hill due to the effect of							
	a. balanced force.	b. sound energy.						
	c. kinetic energy.	d. gravity force.						
	2. When the roller coaster stops, its							
	a. doesn't change.	b. increases.						
	c. decreases.	d. becomes zero.						
	3. The kinetic energy of a car increases by							
	a. decreasing its speed.							
	b. increasing its speed.							
	c. keeping its speed without changing.							
	d. decreasing the pushing force a	cts on it.						
	(B) What happens if ?							
	A roller coaster moves from up to	o down. (according to the change of ener	gy).					
	*** ** ******** * * * * * * * * * * * *							
2	(A) Put (✓) or (X):							
	1. Objects that don't move have no	energy. ()					
	2. As the roller coaster moves up a	2. As the roller coaster moves up a hill, it stores potential energy. (
	3. When a moving object is affected by two equal opposite forces, it will stop. (
	(B) Give a reason for the following	:						
	A sand surfer moves very fast do	wn the sand slope.						
		(according to the change of ener	rgy).					
	***************************************	The state of the s						
Œ	Look at the following figure, then	complete the following sentences						
2	The bicycle stores energy when it	moves	_]					
	from point to point							
	The speed of the bicycle Increase	es es						
	when it moves from point	2	e de la companya de l					
	to point		3					
	3. The energy of the bicycle	Will owner,						
	by increasing its speed.							

Self-Assessment 29 till Lesson 2

1	(A) Choose the correct	it answer :				
	1. You do work in all t	he following sit	uations except			
	a. pushing a woode	en box for a dis	stance.			
	b. throwing a stone	for a distance.				
	c. lifting a bag up fo	or a distance.				
	d. pulling a big tree	which doesn't	move.			
	2. A flying airplane in	the sky has	x 4 9 3 9 3 3 3 3 7 4 9 7 8 9 9			
	 a. potential energy 	only.				
	b. kinetic energy of	nly.				
	c. both potential ar	nd kinetic energ	gies.			
	d. neither kinetic n	or potential ene	ergies.			
	3. You can see all fol	lowing, except				
	a. the light of the S	Sun.	b. the reflected light of			
	c. the light of the c	andle.	d. the sound of a radio).		
	(B) Give a reason for	the following	0			
			wards, its potential energ	y increases.		
				**** ** ** **	****	
7	(A) Put (V) or (X):		<u> </u>			
	1. Sound energy car	he seen easil	v		()
			bject to move a distance.		()
			lied but the object doesn'		ì)
					`	·
	(B) What happens if		1- the	the shares of	00000	ועו
	A ball falls from ye	our nand toward	ds the ground.(according to	the change of	energ) y /-
	***************************************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1841044501110111111111111111111111111111		
1	3 Look at the opposit	e figure, then	choose the correct answ	er:		
	1. Book number	has the	most potential energy,	10		
	a. (1)	b. (2)				l
	/- /	d. (4)			(2)	1
	2. Book number	has the	e least potential energy.	4	i i	200
	a. (1)	b. (2)			- 0	1
	c. (3)	d. (4)				

3. Book number (2) h	as potential er	nergy more than that of		
a. book number (3)	only.	b book number (4) only.		
c. books number (1	l) and (3).	d. books number (3) and (4).		
4. Book number (3) h	as potential e	nergy less than that of		
a. book number (4)	only.	h book number (2) only.		
c. books number (*		d. books number (2) and (4).		
Self	Assessm	ent 30 till Lesson 3		
(A) Choose the corre	ect answer '			
1. The stored energy	in a battery pl	laced inside a flashlight can be change	ed into	
energies.				
a. sound and light		b. electrical and chemical		
c. light and therma	1	d. chemical and kinetic		
2. A bird flying in the	sky has			
a. potential energy	-			
b. kinetic energy o				
c. both potential ar	-	rgies.		
d. neither potential				
3. When a spring is o				
	ompressed, it	b. potential		
a. chemical		d. light		
c. thermal	at Callandina	_		
(B) Give a reason for	the following]: - hattan; diffore from that of a hall at th	o ton of	ř
	tial energy in a	a battery differs from that of a ball at th	ie tob o	
a hill.				
*************************				,,,,,1
**** * * ******************************				
(A) Put (V) or (X):				
1 Some forms of en	ergy can be cr	reated and also can be destroyed.	()
2. There is only one	form of energy	y, which is the potential energy.	()
3. Batteries stores el	ectrical energy	y.	()
(B) What happens if				
A ball is thrown u	pwards.	(according to the change of	of energ	y).
The section of the se	10110101114111411141114111411114	ining the second of the second		54.4

3 You have three devices (A), (B) are	nd (C) , if you know that :		
- Device (A) changes chemical en	ergy into light and thermal energies.		
 Device (B) changes electrical en 	ergy into kinetic energy.		
 Device (C) changes chemical en 	nergy into thermal energy.		
Choose correct answer:			
1. Device (A) may be			
a. a flashlight.	b. a television.		
c. an electric heater.	d. a radio.		
2. Device (B) may be			
a. an electric heater.	b. an electric lamp.		
c. an electric fan.	d. a radio.		
3. Device (C) may be			
a. a gas oven.	b. an electric fan.		
c. an electric mixer.	d. a radio.		
	and the state of t		
Saltassin	39 35004		
11 Choose the correct answer:			
1. Both food and batteries,			
a. store mechanical energy.	b. store chemical energy.		
 c. produce chemical energy. 	d. produce light energy.		
2. Both radio and television	rino41		
 a. are operated by gravitationa 	l energy.		
 b. are operated by mechanical 	energy.		
c. produce sound energy.			
 d. produce chemical energy. 			
3. Electric heater produces	energy.		
a. electrical b. sound	c. thermal d. light		
2 (A) Put (V) or (X):		-	
1. The energies produced from te	elevision are sound and light.	()
2. There are some forms of energian	gy, that can be destroyed.	()
(B) You have four objects (A), (B)), (C) and (D), if you know that:		
- Object (A) can't move but can			
- Object (B) is an apple.			
- Object (C) produces light and t	hermal energies.		
- Object (D) doesn't produce ligh	nt energy.		

Choose correct answer:		
1. Object (A) may be		1 timbré
a. electric lamp. b. radio.	c. food.	d. flashlight.
2. Object (B) stores energy.		. (9lmå
a. mechanical b. thermal	c. chemical	d. light
3. Object (C) may be		d. the Sun.
a. alarm bell, b. radio.	c. food.	d. the carr
4. Object (D) may be		d. electric lamp.
a. the Moon. b. the Sun.	c. flashlight.	0, 6,600.0
B Look at the following figure, then	choose the correc	ct answer:
1. Wires inside the flashlight have	energy.	The same of the sa
a. sound	b. light	
c. electrical	d. chemical	2
c. electrical 2. Which part inside the flashlight s	tores chemical en	ergy f
a. Battery.	D. AAILES:	
1	d. Its body.	2
 C. Lamp. Which form of energy in the flash 	nlight you can see	<i>7</i>
a. Electrical energy.	D. Light energy	
c. Thermal energy.	d. Chemical er	
Self-Assessm	ente 32 till L	esson 🖏
Choose the correct answer:		
1 When you stop on the ground wi	thout moving, so	you have
a, the most kinetic energy.	D, NO KINELIC EL	ieigy.
t - stantial energy.	d. the least ligh	nt energy.
c. the most potential energy 2. All the following forms of energy	do not affect the	movement of a moving object
except		
a. sound energy.	b. light energy.	
c. electric energy.	d. kinetic ener	
3. The most potential energy store	a in an object, is ti	nat when it is
a, moving on the ground.		
the top of a hill.	4b	
a standing without movement of	n ine ground,	
d. at the bottom of a hill.		

2	What	happens	if	W.D.B	?
---	------	---------	----	-------	---

Anna carlel	
A ball at 50 meters height from the grou	nd starts to move down.
	(according to the change of energy).

	essionedith paralest potable till pillootis tilop — saa leid pilopjerasise(**** -

B Look at the opposite figure, then choose the correct answer:

- 1. The ball number..... has the most potential energy.
 - a. 1
- b. 2
- c. 3
- d. 4
- 2. When the ball number 1 moves up from its position to the position of ball 2, so its
 - a. potential energy changes into kinetic energy.
 - b. kinetic energy changes into potential energy.
 - c. potential energy becomes zero.
 - d. kinetic energy doesn't change.
- 3. When the ball number 3 moves down from its position to the position of ball 4, 5
 - a. kinetic energy changes into potenza lanergy.
 - b. kinetic energy doesn't change.
 - c. potential energy doesn't change.
 - d. potential energy changes into kinetic energy.









Model Exam

on Concepts (2.1) & (2.2)

Total r	nark
-	- 1
اكسا	<u>-</u>

(5 marks)

	_		
1 (A) Choose the correct answer:	serges except		
1. All the following objects are affected	d by unbalanced forces, except		
a. a person sitting on a chair.			
b. a ball moves on the ground.			
c. a plane flying in the sky.			
d. a person jumps up in the air.2. When we turn on a television,	andenergies are produce	d.	
a. sound - chemical	b. light - one		
c. sound - light	d. solar – light		
3. By increasing and and	, the potential energy increases.		
a. mass - weight	b. mass – height		
c. mass - speed	d. height – speed	nakes	
4. If we fix some fire extinguishers of	nto a cart, the air that moves	110110-	
the cart moves forward.			
a. forward	b. upward		
c. downward	d. backward		
(B) What happens if? A child moves down along the sli	ide (concerning the change of	energ	y).
(A) Put (V) or (X):		(5 ma	rks)
1. Sound waves is a form of potenti	al energy.	()
2. We can say that a body is in mot	ion if its position changes relative		
to a moving point.		()
3. Food provides our bodies with er	nergy.	()
4. Their is a work done, When you	write on the keyboard of a computer.	()
(B) Give a reason for the following):		
We can't live without eating foo	d.		
eventions with an additional data to the control of	Production of the design of the sample of the same of		

(A) Complete the fo	llowing sentences using the words below	: (5 marks)
	(long - potential - gravity - work)	
1. When a ball is pu	ushed up in the air, the ball stores	energy.
	e is applied on a chair to move it, so a	
	erfall falls down into the lake due to the effort	
4. When you kick a	ball on the ground hardly it will travel a	distance.
	oosite figure, then answer the following qu	
1. What is the nam		
2. What happens i parachutes?	f this truck is not provided with	
(A) Write the scie	ntific term of each of the following :	(5 marks
1. A fastest truck i	n the world, which is operated by the help o	f three jet engines.

2. It is the force the	nat is found between a tire or or living bicyc	le and the road.
3. A form of energ	gy that increases by increasing the speed of	
4.4	to and decorate forms a small s	(**************************************
4. An energy that	is produced from a radio.	
(B) Look at the o	pposite figure, then choose the correct ans	wer:
	the most potential energy	
in position numb		3
a. 1	b. 2	16
c. 3	d. 4	

Self-Assessments

on Concept (2.3)

Self-Assessment 33 on Lesson 1

(A) Choose the correct answer:	ti di - Callanda		
1. When a fast car hits a very big s	tone that doesn't move, all the following		
situations may happen except	11+1, 16+411		
a. the speed of the car becomes	zero and it will stop.		
b. the energy of the car transfers			
c. the airbags are inflated and fill	ed with a gas.		
d. the car keeps moving and its	speed increases.	000	
2. The safety equipment that have	an important role during collisions between	5611	
cars includes			
a. airbags only.	b. seatbelts only.		
 c. airbags and seatbelts. 	d. car tires and steering wheel.	wach	od
3. During collision, all the following s	situations may occur to the speed of the o) GOID	eu
cars, except it will	c. become zero. d. remain as it is.		
a. increase. b. decrease.			
(B) Give a reason for the following):	late	
After collision, the airbags defla	te through their holes are est as they inf	idic.	
(A) Put (V) or (X):			
1. Hitting a cricket ball with the bat	causes a change in its speed and		,
its direction.		(
The wrecking ball is used to des		()
3. Transfering kinetic energy occur	s only from moving object to an		,
object that doesn't move, when t	hey collide together.	()
(B) What happens if ?			
The sensors of the car airbags fe	el a strong crash with the car's body.		
			,,,,,
Complete the following paragraph	using the words below :		
- Inerental	kinetic – car – bicycle)		
When a moving car collides with a temperature damaged than the	bicycle, the car transfers its ene	irgy t s bee	0 3N

Self-Assessment 34 till Lesson 2

1 (A) Choose the correct answer:			
 All the following things are used to n 	nove cars, except		
a. gasoline, b. food.	c. electricity.	d. solar energy.	
If a car carries a heavy mass, the dr of collisions.	iver must move	to avoid damages	ı
a. with a slow speed	b. with a high sp	peed	
c. with a low potential energy	d. with a high po	otential energy	
3. When a fast moving truck collide with energy of the truck	nical energies. the small car.	nall car, some of the kinet	ic
(B) Calculate the speed of a moving ca 240 kilometers in 4 hours.	r, if you know the	nt it covers a distance of	
2 (A) Put (V) or (X):			_
1. When the kinetic energy of a moving	body increases, it	s speed decreases. ()
2. The only form of energy that cannot	be stored is the t	nermal energy. ()
3. If a collision happens between two I			
in the same direction, a small amou	nt of damage is o	ccurred. ()
(B) What happens if ?			À
		william to the blooding opposit	
The speed of a moving object increase	ses. (acco	ording to its kinetic energy	<i>}.</i>

d, D

c. C

Car

Car

	2. Car (D) ha:	s kinetic energy m	ore than car	***		
	a. A	h D		d. D		
	If a collision damage.	occurs between	car and a \	wall , it will cause the m	IOSU	
	a. A	b. B	c. C	d. D		
	4. If a collision damage.	occurs between	car and a v	vall, it will cause the lea	ast	
	a. A	b. B	c. C	d. D		
		Self-Assess	ment 35 (til)	Lesson 3		
1	(A) Choose th	e correct answer				
	 If there is a another colar another colar another colar another collection. b. both collection the first of the first of the first of the energy and is convered. c. is convered. is convered. If a moving 	collision between two isions don't cause isions cause the scollision causes mecollision causes less produced from the ted into chemical ted into kinetic ented into gravitation car makes a collision of damage to the into damage to damage to damage to damage the into damage to damage to damage the into damage th	two large masses of small masses of any damage. ame amount of dates damage than the burning fuel in a potential energy, and potentia	the second collision. The second collision.	o	
	(B) Give a reas	on for the followi	ng:			
	more dame			ehicle with a large masss during collision.		
2	(A) Put (🗸) or	(X);				
	Large mass energy whe	vehicle and small n they move with t	The manifes about 1	ve the same kinetic		
		at a high speed, your ard inside the car			()
	3. When an obdecreases g	ject decreases its	speed gradually,	so its kinetic energy	()
56	000,00000	•			()
ALJ I					-	

(B) What happens if ...?

The mass of a moving object increases.

(according to its kinetic energy),

3 Look at the opposite photos, then choose the correct answer:



Train speed = 90 km/hr.



Truck speed = 90 km/hr.

- 1. Kinetic energy of the train is that of the truck.
 - a. less than
- b. more than
- c. equal to
- d. half to
- 2. During collision, the train causes more damage than the truck as it has the truck.
 - a. more mass than

b. less mass than

c. equal mass as

- d. half the mass of
- 3. All the following sentences are correct except
 - a. the train has the most mass
 - b. the train and the spuck make an a same, an aka
 - c. the truck has the many was
 - d. the truck has the least kinetic energy.

Self-Assessment 36 till Lesson 4

(A) Choose the correct answer:

- 1. A wooden box that doesn't move, gains the largest amount of kinetic energy when a moving car with a speed equals hits this box.
 - a. 30 km/hr.
- b. 50 km/hr.
- c. 80 km/hr.
- d. 120 km/hr.
- 2. As the angle of the ramp increases, the kinetic energy of an object moving downward this ramp will
 - a. increase.

b. decrease,

c. remain as it is.

- d. change into light energy.
- 3. The kinetic energy of a moving car down a ramp is affected by
 - a. the mass of the car only.
 - b. the angle of the ramp only.
 - c. both the mass of the car and the angle of the ramp.
 - d. both the mass and color of the car.

(B) Give a reason	for the following	ng:		
The kinetic en	nergy of an object	t that moves dowr	a ramp increases by	
increasing the	angle of the rar	mp.		
46 487 438 4415918441		***************************************	***************************************	
*** ** *** *** *** *** ***	**********************	13,11100111111 - 141 1 , 44(411111111100		* ** ***
(A) Put (V) or (X)):			
1. Objects of the	same masses th	nat moves with diff	erent speeds, have	
	unt of kinetic en			(
			ne kinetic energy of	
	es on it upward o			(
	-	ount of kinetic ene		
		pushes the persor	for a long distance.	(
(B) What happens	if ?			
Increasing the	mass of an obje	ect that moves dow	n a ramp.	
		(according to th	e kinetic energy of the	obiec
the same ramp w	ith length 6 met		sses and move dow	
Choose the correct				
1. Car (A) travels	the ramp in 3 se	conds, so its spe 3	d =	
a. 2 km/hr.		c. 6 km/hr.		
2. Car (B) travels	the same distant	ce in 6 seconds, se	o its speed =	
a. 1 km/hr.	b. 3 m/sec.	c. 6 km/hr.	d. 1 m/sec.	
3. From the previous	ous results, you o	can find out that	2114 1411	
a. the speed of	car (A) is more	than that of car (B)).	
b. the speed of	car (A) is less th	nan that of car (B).		
	ve the same spe			
	both cars is equ			
4. In your openion	, which of the fol	llowing sentences	may be correct?	
a. Mass of car ((A) = 40 grams, <i>i</i>	mass of car $(B) = 8$	30 grams	
b. Mass of car (_	
	(A) = 80 grams, ı	mass of car $(B) = 4$	10 grams.	
c. Mass of car ((A) = 80 grams, i (A) = mass of car	mass of car $(B) = 4$ r $(B) = 40$ grams.	10 grams.	

Self-Assessment 37 till Lesson 5

📶 (A) Ch	oose the correct answ	er;		
1. Afte	er collision, the distance	e that the last ba	all move on the	other
	wton's cradle, depends			

- side of the depends on a, the stored sound energy in it. b. the stored kinetic energy in it. c. the kinetic energy that is transferred from the previous balls. d. the electrical energy that is transferred from the previous balls.
- 2. Collision of two moving cars at high speeds and move in opposite directions, is that when they are in the same direction.
 - a. not dangerous as
 - b. equal in danger as
 - c. less dangerous than
 - d. more dangerous than
- 3. are two forms of energy that exist in the Newton's cradle during collisions.
 - Kinetic energy and chemical energy
 - b. Potential energy and light
 - c. Kinetic energy and patenties are
 - d. Chemical energy and light energy

(B) Give a reason for the following:

A sound can be heard during the collision between the Newton's cradle balls.

2	(A) Put	6000	(V) -	
4	IAIPUU	וטנען	(4) .	

1.	When you raise up a ball in the Newton's cradle, it stores thermal energy.	()
2.	In Newton's cradle as the height of the raised ball increases, it stores		
	more potential energy.	()
	In Newton's cradle as the amount of the kinetic energy increases, the m	oving	
	distance of the balls increases,	()

(B) What happens if ...?

You leave the moving balls of the Newton's cradle move for a long time.

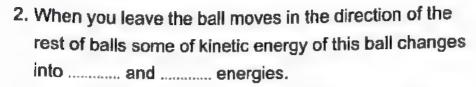
(according to their energy).

Look at the opposite figure, then choose the correct answer:

- 1. When the Newton's cradle ball is raised up without leaving it go, its energy is maximum and its energy equals zero.
 - a. kinetic potential
- b. potential kinetic

c. kinetic - sound

d. kinetic - thermal



- a. sound electrical
- b. thermal kinetic

c. kinetic – sound

d. sound - thermal

Model Exam

compress a toy spring.

on Theme (2)

Total mark
20
17

61

		20								
(A) Choose the correct answer:		(5 marks	5)							
1. When you move something toward	you, this represents									
a. pushing force.	b. light energy.									
c. pulling force. d. sound energy.										
2. The roller coaster has the most energy of motion,										
						b. when it goes down the hill.				
c. when it stops at the top of the hi	ill.									
d. when it stops at the bottom of the	ne hill.									
3. Which of the following sentences	describes the friction force?									
a. It pulls objects toward the groun	nd.									
b. It pushes objects away from the	e ground.									
c. It doesn't affect objects in motion	on.									
d. It slows down or stops objects in motion. 4. The object that has the most kind object. a. the fastest and lightest										
					(B) Give reasons for:					
					1. The shockwave truck is faster than the normal truck.					
					************************************		*****			
* *************************************		******								
2. A roller coaster doesn't need ele	ectricity during its movement down the h	nill.								

2 (A) Put (V) or (X):		(5 mar	À.S.							
	mount of time, the object that travels a lo	onger								
distance has a slower speed.		()							
2. When a cricket bat hits the ball,	, its potential energy transfers to the ball	. (
3. The main difference between p	ulling and pushing forces is the direction	of	_							
the force.	Linta atauad matantial annual t	(1							
 You can change kinetic energy 	into stored potential energy, when you	,								

The airbags in a car don't inflate during a crash. (A) Write the scientific term of each of the following: 1. A force that you make to change the direction of an object awa from you.	(5 mar
1. A force that you make to change the direction of an object awa	(5 mar
1. A force that you make to change the direction of an object awa	(5 mar
1. A force that you make to change the direction of an object awa	(5 mar
1. A force that you make to change the direction of an object awa	
nom you.	ay (
The form of energy that increases when the speed of an object increases.	et (
3. The distance covered by a moving object in a certain time.	(
 Safety equipment used to prevent car passengers from moving forward, when the car stops suddenly. 	g (
(B) Cross out the odd word:	
Electrical energy - Chemical energy - Thermal energy - Light	energy.
	(
(A) Complete the following sentences:	(5 marks
1. When you kick the ball that standing on land, is stalls to move, energy.	because it gets
2. If the speed of an object decreases this m. That its kinetic e	nergy
 When moving objects collide with each other is transfe them. 	rred between
4. Food and batteries store energy.	
(B) A train travels a distance of 240 kilometers in 3 hours, find its	s sneed

PARIT S

Final Examinations:

- El-Moasser Final Examination Models.
- Final Examinations of some Governorates.



El-Moasser Final Examinations

Model Exam

(A) Choose the correct answer:	And the supplier of the suppli		
1. The roots of kapok tree don't grow	v deeply in the soil, because		
a. the soil contains less water.	b the act		
c. the climate is very cold	b. the soil contains more water.		
c. the climate is very cold. The system responsible for many	d. the climate is very hot.		
2. The system responsible for movin touching a hot cup of tea, is the a. digestive	ig your hand away from danger, sucl	n as	
a. digestive b. respirators	system.		
a. digestive b. respiratory Songs of humpback whales in this	c. nervous d. stomach		
3. Songs of humpback whales in win	ner are characterized by each of the	follo	WİI
a. It is for mating season.			
c. having soft sounds.	b. moving better through the me	ř.	
4. When you move something toward	d. having lower .		
a. pushing force. b. light energy.	a you, the contraction of the co		
(B) Give a reason for the following	ານ ມີ ເພື່ອ sound energy.		
Seatbelts in cars are very important			
 (A) Put (V) or (X): 1. Digestion process begins in stoma 2. Some animals have extra abilities abilities are called super sensory at the case of the	that humans do not have, and these	(extra	
 3. Cats have excellent night vision, w 4. The bus that covers 60 kilometers (B) What happens to? The kinetic energy of a moving car 	in 1 hour has a speed = 60 m/sec.	()
4. The bus that covers 60 kilometers (B) What happens to? The kinetic energy of a moving car	If its speed increases.	()
4. The bus that covers 60 kilometers (B) What happens to?	In 1 hour has a speed = 60 m/sec. If its speed increases.	()

3. To increase the speed of a moving ca	ar, we need to the force that acts		
on it.			
 When a moving car hits a tree, a part a energy that you can hear. 	t of energy of the car changes into		
B) Classify the following actions in the force :	e table below according to the needed		
1. Typing on a keyboard.	2. Lifting a bag.		
3. Moving a chair away from you. 4. Kicking a football.			
5. Closing the door from inside a room.			
6. Opening the door of a refregirator.			
Pulling force	Pushing force		
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

	, ,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
(A) Write the scientific term of each of			
1. The part of the kapok tree which is s	(
2. It delivers messages between the sp	· ·		
organs.	(
	ojects rub against each other. (
4. One of the measuring units of time.	(,,		
(B) Find the speed of a runner, if you k in 30 seconds.	snow that he covers 300 meters		
Model E	xam 2		
(A) Complete the following sentences	the motion of the sheelesses to sale		
1. Engineers use to slow down	us of a moving object		
2. The speed affects the energ			
3. In the electric bell, energy of			

	4.	Most animals can hunt when	nergy bounces off a prey int	o their eyes,
		while bats can hunt when ener	gy bounces off a prey into th	eir ears.
	(B) Give a reason for the following:		
		When your friend catches a ball that is the ball is stopped.	thrown in the air, the moven	nent of
		***************************************		*******
-2	(A	() Choose the correct answer :		
	1.	Displaying light is a type of communication	ation that is found in	
			plants and humans.	
		c. animals and humans. d. a	animals only.	
	2.	The speed of a toy car moves down a	ramp increases by increasin	g its
		but its speed decreases by increasing	the	
		a. friction force – mass. b. I	mass – friction force.	
		·	mass – temperature.	
	3.	Human can help restoring ecosystem	by all of the few emplactivition	es,
		except	1	f h -
		a. replanting the cleared forests.	rence inglair and water pollu	itants.
		c. producing more factories exhausts.	,	
		d. preserving existed plants and anima		
	4.	When a car moves up a hill, this happe		
		a. gravity force. b. balanced force. c. s	souna energy. a. kinetic en	ergy.
	(B) What happens if ?		
		Light falls on a mirror that has few crac	cks.	
		**************************************	***************************************	*************
		,p,,, estimated, estimated (120 c. c. c. c. c. c. (101)		*****************
3	(A	A) Correct the underlined words :		
		Both factories exhausts and floods pro	duce smog, that causes air	pollution.
				()
	2.	The energy that is produced due to the	friction between the string	and other
		parts of Newton's cradle, is the sound	energy.	()
	3.	Hearing is one of the weak senses of j	erboa,	()

(B) Classify the following materials into	onanue objects and transparent objects :
	er - Metal - Lenses"
Opaque objects	Transparent objects
(A) Write the scientific term of each of	
A group of ants which is responsible is a shortage of food.	(
2. It is the force that pulls objects towar	d the center of the Earth. (
3. A structural adaptation that prevents	the loss of water in the pine tree.
4. The organ used to differentiate between (B) A truck travels a distance of the k	nt 1 t
Model	Exam 3
(A) Choose the correct answer: 1. Which of the following sentences described the ground	escribes the friction force ?
(A) Choose the correct answer: 1. Which of the following sentences do a. It pulls objects toward the ground b. It pushes objects away from the c. It slows down or stops the moving the stops.	escribes the friction force?
(A) Choose the correct answer: 1. Which of the following sentences do a. It pulls objects toward the ground b. It pushes objects away from the c. It slows down or stops the moving the stops.	escribes the friction force?

	3.	The energy that is stored in an obje	ect due to its position, is kno	wn as					
		a. kinetic energy.	b. potential energy.						
		c. electrical energy.	d. chemical energy.						
	4.	When you see a car coming toward away from it.	ds you, the sensory receptor	S	to g∈	ŧ			
		a. in the ears send a signal to the brain first							
		b. in the eyes send a signal to the b	orain first						
		c in the eyes send a signal to sens	ory receptors in the ears						
		d. in the ears send a signal to sens	ory receptors in the eyes						
	(B)) Give a reason for the following :							
		Mirror can reflect the light better that	an a painted surface.						
			,,		*** == 1 (9 + + 4)				
2	(A) Put (🗸) or (X) :	-			_			
	1.	The kinetic energy of a toy car push	ned on a และสมสังเวย is aqual	to the kir	netic				
		energy of another toy car pushed w			()			
		The main difference between pulling	g and purning forces is the d	irection					
		of the force.)			
		Sharp spines are adaptation of different them.	erent plants to prevent animal	s from ea					
		As the height of an object from the	Farth's surface increases, its	potontial)			
		energy increases.		potertial	().			
	(B)) Find the speed of a car that move	s a distance of 240 Kilomete	rs in 3 hr	NIFC '	r			
	(
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
7	1/4	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	f the fellowing						
3) Write the scientific term of each o	•	_1					
		They include the eyes, nose, ears, t information from the surroundings a		eive (1				
		They are present in car airbags, and		•					
		collision.		()				
		A type of surface that reflects light in	different directions when		,				
		the light falls on it.		()				
	4.	A large muscle that contracts during	breathing in and relaxes duri	ing breati	hing				
		out.		()				

(B) Classify the following living organisms according to their habitorganisms live in deserts and organisms live in forests in the following lizard — Panther chameleon — Fennec fox — Kap Palm tree — Barbary fig. plant)	table bolow ·
(Starred agama lizard – Panther chameleon – Fennec fox – Kar Palm tree – Barbary fig plant).	pok tree –

Organisms live in deserts	Organisms live in forests
(

4	(A)	Complete	the	following	sentences	:
		_			a a life life ?	

- 1. During swallowing, the food passes from the throat to the then to the inside your digestive system.
- 2. During inhalation, air travels down from your throat to your lungs through
- (B) Compare b.

Points of the section	Inhelation	Exhalation
1. Diaphragm movement :		
2. Size of chest cavity :	\$\$#A\$#\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
3. The air is rich in :	gas.	gas.

Model Exam 4

1	(A) Write	the	scientific	term	of	each of	the	following	;
---	-----------	-----	------------	------	----	---------	-----	-----------	---

1. A property that helps animals blend in with their surrounding	environment.
	()
A system that works inside the human body such that it keep	s the human away
from danger.	**************
3. The energy that is used to operate television.	()
4. The force that makes an object moves a distance.	()
(P) Give one example for the following:	
One of the sources of light which gives out its own light.	()

2 (A) Choose	the correct answer:		
	ntial energy of an object	depends on	
a. its mas		1 1	
	ht from the Earth's surfa	ace only.	
	s and its height from the		
d. its temp	—		
		rioral adaptation in the panthe	r chameleon.
	up its body during dang		
_	ye can move independe		
c. V-shape		d. Long sticky tongue	
		water lily plant is that	
a. it has lo	ong roots.	b. it has sharp spines.	
c. it has tir		d. it has wide leaves.	
	ollowing are examples	of motion except	
a. a runni r	ng person.	b. a ball travelling through the	sa nie
c. a flying		d. a sleeping dog.	tim still.
(B) What hap	mens if 7	and the state of t	
		oriolo ès a caracteristica de la caracteristica de	
	waste mat	erials to variable, and soil in	an ecosystem.
2 (1) 6			
	he underlined words:		
1. The balance	ced forces cause the ob	ect to move.	()
Z. vvnen you	turn on a radio, the ele	ctrical energy changes into ligh	nt energy.
			()
4 The system	energy depends on the s	speed of an object.	()
the digesti	ve system.	es of living organisms for seei	
			()
(b) A deel 14	ns a distance of 200 Me	eters in 5 seconds. Calculate it	s speed.
	, ega 444461399744334833497494434494343434 4 413113	(H))) 111 [[1]]) [1] (((((((((((((((((((((((((((((((((((
4 (A) Complete	e the following sentence	es :	-
1. On hearing	g an alarm ring, the sens	sory receptors that are found in	the.
boria a mo	goage minnight a HarMOL	k of nerves to the which	h determines

use	. by doing a special da	communicate with each other,	while bees
3. If the kinet	ic energy of a moving by	nces to communicate with each other, ody decreases, its speed will	h other.
	ar a morning be	buy uecreases, its speed will	

(B) Compare between:

Points of comparison	Polar bear	Forest bear
1. Habitat :		
2. Fur color :	,	
2.1 0. 0010[,	*** ***********************************	}4 + 4 + + + + + + + + + + +
	***************************************	2

(A) Choose the correct answer: 1. When a car suddenly stops, the passengers move a backward. b. forward. c. upward. d. downward. 2. Reading and writing are common types of communication in world. a. humans b. animals c. birds d. plants 3. Bears that live in forests have fur that of polar bears. a. whiter than b. darker than c. similar to brighter than 4. When the robe, coesist a use is small of notion a. doesn't change. c. decreases. d. becomes zero. (B) What happens if? The length of acacia taproot doesn't exceed 3 meters downward. 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. () 3. After car collision, the airbags deflate as fast as they inflate. ()		∉Wāā	el Exam 5			
1. When a car suddenly stops, the passengers move	(A) Choose the co		CI ENGIII			
a backward. b. forward. c. upward. d. downward. 2. Reading and writing are common types of communication in			naccondate move			
a. humans b. animals c. birds d. plants 3. Bears that live in forests have fur						
3. Bears that live in forests have fur	2. Reading and w	riting are commo	n types of commu	nication in w	orld.	
a. whiter than c. similar to belower than 4. When the robe, possible and it should have a long and the robe of should	a. humans	b. animals	c. birds	d. plants		
c. similar to before than 4. When the role, posses alone is energy of motion	3. Bears that live	in forests have fu	ır that of p	olar bears.		
4. When the role, problem as the series of section	a. whiter than		6 darker than			
a. doesn't creation. c. decreases. d. becomes zero. (B) What happens if? The length of acacia taproot doesn't exceed 3 meters downward. 2 (A) Put (V) or (X): 1. At night, cats eyes look like small lighted lamps. 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment.	c. similar to		brighter tha	n		
c. decreases. (B) What happens if? The length of acacia taproot doesn't exceed 3 meters downward. (A) Put (//) or (X): 1. At night, cats eyes look like small lighted lamps. 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment.	4. When the role		series of modern	1		
(B) What happens if ? The length of acacia taproot doesn't exceed 3 meters downward. 2 (A) Put (V) or (X): 1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment.	a. doesn't cress	1 A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	increases.			
The length of acacia taproot doesn't exceed 3 meters downward. (A) Put (V) or (X): 1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()	c. decreases.		ೆ. becomes ze	его.		
(A) Put (V) or (X): 1. At night, cats eyes look like small lighted lamps. 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()	(B) What happen	s if ?				
1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()	The length of a	acacia taproot do	esn't exceed 3 me	ters downward.		
1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()	**** *** **************			*1*4** >>>* ****************************		
1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()					*********	
1. At night, cats eyes look like small lighted lamps, 2. The sandy-colored fur of caracal helps it blend in with snow in polar environment. ()						
The sandy-colored fur of caracal helps it blend in with snow in polar environment.						
environment, ()					()
		ored fur of caraca	al helps it blend in	with snow in polar	,	,
A ARTOR COLLECTIONS III. IIII GIIR GARRENI TERRIT MET MET MET MET MINET IIII GIIGI.		ion, the airbags d	leflate as fast as th	ev inflate	(,
4. The stopped object can't move until a force acts on it.					()

(B) Look at the following pictures, then choose if the forces are "balanced" or "unbalanced":



1. A book on a table (Balanced - Unbalanced)



2. A seesaw (Balanced – Unbalanced)

_		
3	(A) Write the scientific term of each of the following:	
	A type of foxes that has sandy-colored fur to adapt its desert environment.	
	2. It is the force that pulls objects toward the center of Earth.	(
	Safety equipment used to provide soft cushion, when it is inflated automatically with a gas during collision of cars.	
	4. A plant lives in salt water behitet and best transitions.	(
	 A plant lives in salt water habitat and has long, strong roots to resthe water waves. 	sist
		(
	(B) Give a reason for the following :	
	Branches of acacia tree are gather on the top of its trunk.	
		** ******
4	(A) Correct the	
	1. Keeping the position of an enject relative to a said point represen	its motion.
		()
	Moving an object towards you represents a pushing force.	1
	3. Seatbelts absorb the energy of the car due to its collision and gets	s inflated.
	A Under the effect of muchine force of	()
	4. Under the effect of pushing force of gravity, anything falls down to	the ground.
		()
	(B) Look at the following figures, then complete the following sent-	ences :



Part (1)



Part (2)



Part (3)

1. These body parts belong to the sy	vstem.
2. When you touch a freezing bottle of wa	tor nert number in your hand
sends a message through part number	ter, part number In your hand
you that this bottle is very cold.	to reach part number lening
the is very cold.	
Model Ex	im 6
(A) Choose the correct answer:	
1. All the following properties are consider	red as structural adaptations in the
panther chameleon, except	
a. each eye can move independently.	
b. openning its mouth wide at danger.	
	ong sticky tongue.
2. When an object is in motion, this mean	s that its changes.
a color b shape c s	ize d. position
3. Pine tree has a triangular shape to mal breaking it. This structural adaptation of climate like the feet of	ennec fox. d. brown bear.
a. caracal. b. penguin. c. f	ennec fox. d. brown bear.
4. If there is nothing to stop the movemen	it of an object, this object this has a
a. stay in monor.	suddenly stop. stop after few seconds.
C. Stop arter for mine	grop after lew accorde
(B) Give a reason for the following:	and adaptation
Some animals have the ability to make	camounage adaptation.
(A) Put (V) 1. Unbalanced forces keep an object in it	s place without moving. ()
Unbalanced forces keep an object in it The moving objects only have energy,	while the objects that don't move
2. The moving objects only have	, hlood
have no energy. 3. In penguin's feet, the cold blood vesse	Is can warm up the warm blood ()
3. In penguin's feet, the same	()
vessels. 4. The Moon is not considered as a light:	source.
4. The Moon is not believing animals in the	table below:
4. The Moon is not considered as 4. (B) Classify the following animals in the (Fishing cat – Do	phin - Tarsier - Bat)
(11011110	Animals have super hearing sense
Animals have super sight sense	Animale nate and
Animals have sep	
the state of the s	7

3	(A) Write the scientific term of each of the following. 1. An organ in the human digestive system that has the putrionts the system to the system.	ng: stiny blood vess	sels to absorb
	the putrions at the human digestive system that the	3 4117	()
	the nutrients through its walls. 2. A feature in the bull shark, in which the upper sull is darker than its lower surface.		
	The ability to do work or cause a change.	a uss-annt	(
	 The organ used to differentiate between the taste types of food. 		()
	(B) Amir rides his bike and covers a distance of 15 Calculate the speed of the bike.	0 meters in 5 se	econds.
		***************************************	,,,
4	(A) Correct the underlined words:		
	 Two objects have the same mass and stopped a have the same kinetic energy. 	t the same heig	ht, ()
	2. A car battery stores a form of kinetic energy know energy.	wn as chemical	()
	3. As the object moves faster, its potential energy in	ncreases.	()
	4. During hitting a ball the cricket bat transfers its lig to the ball.	ght energy	()
	(B) Look at the following figures that represent the answer the questions:	e respiration pr	ocess, then
	1. Which figure represents		
	inhalation. ()	7	-91
	2. Which figure represents		3
	exhalation. ()		1/2/5
	3. In figure (a) muscle		
	contracts and the size of chest		
	4. The air that comes out in		
	figure (b) is rich in gas.	6:>	
	iigaio (s) is itteriore	Figure (a)	Figure (b)

Model Exam 7
(A) Choose the correct answer:
1. Camouflage means that the animal
a. can be seen easily among its surrounding.
b. is hard to be seen among its surrounding.
c. is easily to be seen by its preys.
d. can be seen easily by its predators.
2. The five senses of humans and animals include
a. sight, hearing, touch, smell, and movement.
b. sight, movement, taste, touch, and smell.
c. taste, touch, movement, hearing, and smell.
d, sight, hearing, taste, smell, and touch.
3. When an object moves down a ramp, its stored energy
a. increases.
b. doesn't change.
c. changes to a less reduce form of energy
d. changes to a more and the ps the real gleat to catch a prey at night,
in that
a. it can feel the heat of prey's body.
b. it can hide inside the forest.
c. it can digest its prey easily.
d. it has excellent night vision.
(B) What happens if? (B) What happens if? (according to the change of energy)
d. it has excellent regular defends and the other parts of Newton's cradle during the change of energy (according to the change of energy)
collision.
(A) Complete the following sentences: 1. Armong animals that can live in polar environment are
(A) Compression and that can live in penergy and it produces and and
2 (A) Complete the following sentences 1. Among animals that can live in polar environment are
1. Among animals the energy and the
 Television operates by energies. When objects collide with each other,
and it used by samples

Amb	(C):	1
(B) Choose from column	(A) what suits it in both columns (B) and (C):	_

(A) Living organisms	(B) Species	(C) Habitats
1. Bull shark:	a. reptile	A. savannah
2. Starred agama :	b. amphibian	B. salt and fresh water
3. Acacia :	c. fish	C. wet environment
4. Frog:	d. plant	D. desert environment
	0	4

3 (A) Put (🗸) or (X) :			
1. Exposing to air rich in dust for a long time harms the human re	respiratory		
system.	(<i>)</i>	
2. If two objects travel for equal period of time, the object that tra	grels		
a greater distance have a slower speed.	(1
3. When an object moves faster, it gains larger amount of sanetic	energy. ()
4. Camouflage helps animals adapt the extreme weather condition	ons in their		
ecosystems.	()
(B) Find the speed of a horse, if you know that it covers 250 me (A) Write the scientific term of each of the following:	eters in 5 seco	nds	-
	eters in 5 seco	nds	-
(A) Write the scientific term of each of the following :		nds 	-
(A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air and	nd		-
(A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide.	(10040b400000000000000000000000000000000		-
 (A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide. 2. An animal that has multiple bright colors to provide camouflage 	e in its)	-
 (A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide. 2. An animal that has multiple bright colors to provide camouflage environment and has V-shaped feet. 	e in its)	-
 (A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide. 2. An animal that has multiple bright colors to provide camouflage 	e in its)	-
 (A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide. 2. An animal that has multiple bright colors to provide camouflage environment and has V-shaped feet. 3. The liquid that stores chemical energy, and it is used to move on the colors. 	e in its)	-
 (A) Write the scientific term of each of the following: 1. A process through which the body gets oxygen from the air an expels out carbon dioxide. 2. An animal that has multiple bright colors to provide camouflage environment and has V-shaped feet. 	e in its)	-

Madel Exam 8

11 (A) Put (V) or (X):	
1. A moving object is not affected by f	friction force. ()
	g the night than hunting during the day. ()
3. The object that travels down a ram	p is affected by the force of gravity. ()
4 Eves are one of the five senses, or	n which humans and animals depend on
to see the surroundings.	()
(B) Give a reason for the following:	
The measuring unit of speed is kn	n/hr or m/sec.
114	41 [11110] 111 70 [254] - 477 40 440244011[1]11 - 171226 - 41111773 447 444075 739
(A) Choose the correct answer:	e literak
1, If the angle of inclination of a ramp	increases, the kinetic energy of an object
moving down it will	
a. decrease. b. increase.	remain as it is. d. be destroyed.
2. In Morse code, long flashes can be	a used to represent
a. dots only.	eas es only.
c. both dots and dashee.	neither dots nor dashes.
a un-bedle change trees include	
a. mangrove tree and acacia tree.	b. mangrove tree and kapok tree.
to and kanok tree.	d. Darbary by and water mies.
Acada tree and kapok tree A. Fennec foxes and arctic foxes live	in burrows, this belongs to
adaptation.	
a only structural	b. only behavioral
hobayiofal	d. neither structural nor behavioral
(D) A train travels from Cairo to Alex	xandria for a distance of 220 kilometers in
2 110433	es were an appropriate the processor transmission for the first to the
(A) Correct the underlined words:	141 - 1
(A) Correct the under increases, th	ne damage that occurs during its collision ()
1. As the mass of a car more	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
decreases. 2. Air enters the mouth of fish and the	en passes across its gills. ()
2. Air enters the mouth of his same	77

	ts. (
3. The sense of eyesight of owls is weaker than that in ba	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
4. Groups of ants within a colony have similar roles.	
(B) What happens if?	
The amount of food in the ant's colony decreases.	
To a recommendation to the control of the recommendation of the control of the co	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
***************************************	***************************************
(A) Cross out the odd word:	
1. The Sun – The Moon – Fire – Candle.	*****************
2. Bats - Fireflies - Blind person's cane - Dolphins.	(,. ,. ,
3. Fennec fox - Starred agama lizard - Panther chameled	n –
Bull shark.	
4. Guitar – Flashlight – Radio – Alarm bell.	(
(B) Look at the opposite figure, then complete the follow	ing sentences :
1. The person in this figure use	1 mg - 1 mg
to land safely.	September 1
2. The idea of person landing in this figure is the	
same idea of stopping the motion of	*
Model Exam 9	
(A) Complete the following sentences:	
1. The bee dances in a figure-eight pattern while vibrating i	ts and
the other bees read the of the dancer and then f location.	ly off to the specific
2. When two cars move on the same road, car (A) moves a	nt speed equals
10 m/sec., and car (B) moves at speed equals 20 m/sec.	., this means that car
moves longer distance than carin the sa	
3. Humans, amphibians and reptiles have to breath	n oxygen gas in air.
4. Among safety equipment used during collision of cars are	, and
(B) Give a reason for the following:	
If you push two similar toy cars, one of them may travel than the other.	for a longer distance

(A) Put (🗸) or (X) :				
1, As human needs	clean water to dri	nk, fish needs clea	an air to breathe.	(
2. Seatbelt is one of				(
3. Animals communi			ent senses.	(
4. The desert lizard				s. (
(B) Find the speed of	a runner, if you l	cnow that he cover	rs 400 meters in 20 s	second
			>>> c) < 111 > >>> + + + + + + + + + + + + + + + +	
	*** ***********************************	**** **********************************	,	******
(A) Write the scient	ific term of each	of the following:		
1. A group of ants w	hich is responsib	le for protecting th		
dangers.				
2. An animal that ha	s a layer of fat a	nd dense feathers		
cold weather.			•	
3. The visible form of			•	
4. A system that wo				
organism away fr	om dar 30		(
(B) What happens is	F?			
Bats cannot use	echolocation pro	operty.		
			41) 4)14 71 4 500147454411515555555	
4 (A) Choose the cor			. avenué	
1. All the following		energy are correct	., except	
a. It can be store	d in an object.	iest to another en		
b. It can be trans	ferred from an or	oject to another on	е,	
c. It can be trans	formed from one	form into another	one,	
d. It can be dest	royed and cannot	pe created.	-L-4	
2. The blind persor	i's cane and	emit a nign-pit	ched sound that bou	inces (
objects forming	an ecno.	c. bull sharks	d. bats	
a. lizards	b. polar pears	something	le movino	
3. Speed is a mea	surment of now	c. fast	d. heavy	
a. long	b. tall		u. Houry	
4. A very big truck	needsto	b. small engine		
a. very small en	gine	d. no engine		
c. very big engit	10	u. IIV erigilio		

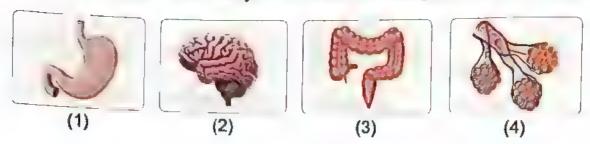
(B) Write the senses that can be used in each of the following types of communication in the table below:

Types of communication	The used senses
1. Watching TV.	
2. Flashing lights of fireflies.	
3. Echolocation in dolphins.	
4. Using the cell phone.	

	Mod	el Exam 10	
(A) Choose the	e correct answer :		
	d cars are		
a. not able to	o produce sound er	nergy.	
	o produce kinetic e		
	obtaining energy to		
	adaptation to live a		
	actions are conside		
a. force.	b. device.	c. energy.	d. adaptation
3. The nervous	s system can do all	the following func-	tions, except
a. gathering	information.		
b. processin	g information.		
c. sending s	ignals.		
d. falling of r			
4. The speed of	of an object is meas	ured in or	meters per second.
a. kilograms	per hour		
b. grams pe			
c. kilometers	•		
	per kilometers		
	on for the followin		
The spinal function.	cord plays an impo	rtant role in the ne	rvous system to do its
1071400000000000000114144	***************************************	*** ***********************************	**!!****** £[30]**!***********************

Most of ene	rty is used by and animals to locate their ergy in the Newton's cradle is transferred from the first ball t
the rest of balls.	energy of any moving object we must increase its speed
	ard a distance 100 kilometers in time equals 2 hours.
(A) Choose from colu	mn (B) what suits it in column (A) :
(A)	(B)
 Esophagus Small intestine Large intestine Stomach Mouth 	a. absorbs water from the undigested food to become solid waste. o the the food with an acid and digestive juices. c the digestion begins in it. d. food gets completely digested in it. e. is a tube has muscles that move the food down into the stomach. f. solid waste leaves the body through it.
/P) What hannens if	? on the ground and you let a ball out of your hand.
Tou are standing	
(A) Put (V) or (X):	er the same distance in the same time, so they have the sam
1. If two objects covers speed.	(the Ballio status amolling
2. In a complete dar	k room, you can use the senses of touching, tasting, smellin (ets only have energy, while the objects that don't move have
and hearing only.	

- 4. We cannot create a new form of energy, and also we cannot destroy an existed form of energy.
- (B) You have some pictures of different parts of the human body. Write down the organ number in front of the system to which it belongs in the following table :



System name	Organ number		
1. Digestive system :			
2. Respiratory system :			
3. Nervous system :			

Final Examinations of some governorates



on the first term 2022

Put (V)	The state of the s	Governorate	Nasi	City Educational Zone	
/. /	or (x) in	front of the follow	wing statements		
1. Exha	led air car	ries oxygen.	wing statements .		1
2. A per	son can ic	dentify spoiled food	d through the touc	h sansa	7
3. The r	nigration o	of birds to search t	for food is conside	red as form of behavio	ral
adap	tation.		01 1000 10 00115100		(
4. The s	kin is the s	sensory organ that r	makes you feel the	smoothness of the cloth.	(
		lowing sentences:			
		messages to		e nerves.	
		as a means			
		d is an important o			
				stomach, is called	14444
Choose	the corre	ect answer :			
			a that hains the au	simal protect itself from	,
	nies		s that neips the ai	nimal protect itself from	
		b extinction.	c. migration.	d. reproduction.	
	_	ommunicate with e	_		
2. (4.001)					
	unds and	5.000000000000000000000000000000000000	b. taiking.		
a. so	unds and ading.	5.大声音楽	b. talking.d. writing.		
a. so c. rea	ading	white. bliowing allows the	d. writing.	ugh it ?	
a. so c. rea	ading. ch of the fo		d. writing.	ugh it ? d. Glass.	
a. so c. rea 3. Which a. A i	ading ch of the for rock.	bliowing allows the	d. writing. light to pass throu c. Wood.	d. Glass.	
a. so c. rea 3. Which a. A i 4. Which a. Ey	ading the force. The force of the force of the force.	b. Moon. b. Moon. ollowing is a source b. Moon.	d. writing. light to pass throuch. c. Wood. e of light ? c. Fire.	d. Glass. d. Mirror.	
a. so c. rea 3. Whice a. A i 4. Whice a. Ey (A) A d war	ading ch of the forcek. ch of the force check. check c	b. Moon. b. Moon. b. Moon. b. Moon. h. Moon. n locate living org	d. writing. light to pass throuch. c. Wood. e of light ? c. Fire.	d. Glass.	he
a. so c. rea 3. Whice a. A i 4. Whice a. Ey (A) A d was (B) Giv	ading ch of the forcek. ch of the force check. check c	b. Moon. b. Moon. b. Moon. b. Moon. h. Moon. n locate living org	d. writing. light to pass throuch. c. Wood. e of light ? c. Fire. anisms and things	d. Glass. d. Mirror. s under the surface of t	he

	Cairo (overnorate	He	eliopolis Educational Zon	6
Choo	se the correc	t answer ·			
1. Ra	ising the thui	mb up or lower it d	lown is a kind o	of	
a. (colors,	b. codes.	c. waves.	d. lights.	
		animals.	C. Waves.	u. ngritor	
a. i	nocturnal		a not hansin	a d not flying	
3. If a	Car covered	b. morning	c. not neann	ig d. not flying e of 2 seconds, so the sp	
the	car is	a distalled of 10 t	neters in a time	e of z seconds, so the sp)ee(
a. 9	50m/sec.	b. 20m/sec.	c 20m/sec	d. 5m/sec.	
4. The	e roots of pal	m plants help ther	n to	d. Jilliseo.	
a s	stand strong	against the wind.	b reach the	underground water,	
C. f	ixing plants in		d. all the abo		
5. The	e force that c	auses an object to	move a distar	nce is called	
a. v	work.	b. potential.	c. gravity.	d. pull.	
D	/) or (x) :				
		system is respons	ible for the ent	try of air into the body.	,
Z. DO	prims nave a	i strong sight sens	e.		
3. Wo	od is a trans	parent object that	allows ton or	monta tugan sala la	(
4. 1116	seesaw mo	ves up and down	becasuse the f	forces that act on it are	(
-	didificed.				,
5. The	force that si	ows down or decr	eases the spec	ed of an object is gravity.	(
(A) W	rite the scien	tific town of an I			,
1 It is	the dained o	tific term of each	of the followi	ing :	
2. A m	neasurina uni	energy during the a	motion of object	cts. (*****
3. A tv	ne of adapta	tion that helps an	S.	(** ***
				(** ***
(B) 1.	Give a reaso	n for the followin	g :		
50	ome dogs live	in a cold environ	nent, while oth	ner dogs live in a hot	
GII	THUMINGING III	i your opinion, whi	on of them hav	e thick fur ? And why ?	
11441	*********** , (1041114)	* 11 *** *** ****** * * * ****			
····			4 175 1454444 + 414511		
	Give two exa	-			41
OL	yours manare	considered as so	eurces of light.		
****		140)0	******************	***************************************	

Cairo Governorate El-Sahel Educational Zone Choose the correct answer: 1. One of the behavioral adaptations that helps the animal protect itself from a. camouflage. b. extinction. c. immigration. d. reproduction. 2. is covering the body of arctic fox. a. Heavy clothes b. Heavy skin c. Thick fur d. Many feathers 3. ... are panting to lower their body temperature. a. Whales b. Owls c. Foxes d. Bats 4. The ability to do work is a. energy. b. force. c. push. d. pull, 5. Tapetum lucidum exists in all of the following, except a. horses. b. cats. c. humans. d. dogs. 2 Put (V) or (X) : Exhaled air carries oxygen. 2. When the roller was andes down fast, its kinetic energy increases. Some animals can see at night. Human can identify spoiled food through touch sense. (A) Choose from column (B) what suits it in column (A): Column (A) Column (B) a. the energy stored inside the body. Gravity b. the force that pulls things downwards. 2. Friction c. a force that arises between the surfaces of two contacted bodies. Speed d. energy stored inside dry batteries. e, the distance covered per time unit. 4. Potential energy

 Calculate that speed of a rame
10.00.00.00.00.00.00.00.00.00.00.00.00.0

3.

d of a runner that covers 150 meters in 10 seconds.

Carro Gov	ernorate		El-Zeitoun Educational 20	163	
Choose the correct ar	Swer :	,			
1. When light falls on					
a. the surface absor	bs the light	h light r	nasses through it.		
c. the light is refract			ng happens.		
			adapt to the conditions of the	neir	
environment?		triat carri	adapt to the continions of the		
a. Their number incr					
b. They can't stay in		ent			
c. They keep their no					
d. They can survive					
			ors in the eye causing visior	1.	
a. Sound		b. Kinetic			
c. Light		d. Magne			
. All of the following ar	e examples of				
a. kicking a ball.			the rope.		
c. opening the desk's	drawer.		ip your bag.		
		.,	, , ,		
ut (🗸) or (X) :					
. Human can identify s	poiled food in:	ough tout	ch sense.	(
Bats use their sense	of smell to avo	id danger	S.	(
The skin is the sensory	organ that mal	kes you fe	el the smoothness of cloth.	(
Energy is neither desi	troyed nor crea	ated from	nothing.	(
		_			
noose from column (B)	what suits it	in columi	n (A) :		
N)					
Column (A)			Column (B)		
1. Carbon dioxide			agm expands and moves up		
2. Exhalation			ing air in and out of the bod		
	c. is a gas the	at is produ	uced by respiration process		

2.

Column (A)	Column (B)	
1. Gravity	a. the energy stored inside the body.	
2. Friction	b. the force that pulls things downwards.c. a force that arises between the surfaces of two	
3. Speed	d. energy stored inside dry batteries.	
4. Potential energy	e. the distance covered per time unit.	

1	2	3, ************************************	4
Complete the follow			
1. The lungs are one	e of the important org	ans in the	system.
2. When light is refle	ected off a surface in	different directions,	so that surface
is			
The fat layer under adaptation.	er the animal's skin to	warm it is conside	red a
(A) What is a comm	on mean of commun	ication between hu	mans and some
animals?			

- (B) A dolphin can locate living organisms and things under the surface of the water. Explain why
- Gize Gize Giza Educational Zone
- - 2. Sensory receptors send a message (from the brain to the

muscles - from the sensory organs to the brain)

- 3. When a person pushes a car forward, his body begins to sweat heavily because his body his stored energy. (consumes increases)
- 4. The gas oven converts energy stored in the natural gas into heat energy to cook the food. (chemical electrical)
- 2 Choose the correct answer:
 - 1. When a body moves forward, the change that occurs is in
 - a. the position of the body.
- b. the size of the body.
- c. the mass of the body.
- d. the Earth's gravity.

All the following represent the pushing force, except to a. kick a ball. b. press on electrical switch.				
	awer. d. lifting up a bag.			
a. respiratory b. of 4. Raising the thumb up a. colors. b. of Put (//) or (X): 1. The ear is the sense 2. The human digestive 3. When the position of	em helps us to translate messages the as smells and sounds. digestive c. nervous d. circulatory p or lower it down is a kind of codes. c. waves. d. lights. corgan which is responsible for seeing objects. e system breaks down food into nutrients. f a body changes according to a fixed point, the body (
(A) Calculate the speed	of a train that covers 600 kilometers in a time of 6 hours			
Fig. Which of the previous wooden spoon? And	us figures represents the reflection of light rays from a			
Column (A)	Column (B)			
1. Gravity	a. the energy stored inside the body.			
2. Friction	b. the force that pulls things downwards.			
3. Speed	c. a force that arises between the surfaces of two contacted bodies.			
4. Potential Energy	d. energy stored inside dry batteries. e. the distance covered per time unit.			

3.

4,

2.

Giza Governorate

6th of October Educational Zone

	Choose the correc	t answer :				
	1. One of the beha	avioral adaptation	that helps animal p	rotect itself from	enemies	
	is					
	a. camouflage.	b. extinction.	c. reproduction.	d. digestion.		
	2. The force that s	lows down (decre	eases) the speed is	called		
	a. push.	b. gravity.	c. friction.	d. pull.		
	3. The organ respo	onsible for the sig	ht sense is			
	a. the ear.	b. the tongue.	c. the nose.	d. the eye.		
	4. Ability to do wor	rk is				
	a. energy.	b. force.	c. push.	d. pull.		
	5. An animal has t	he ability to turn i	its head in all directi	ons is the		
	a. snake.	b. jerboa	c. dolphin,	d. owl.		
2	Put (/) or (X):	engrant it	· · · · · · · · · · · · · · · · · · ·	s through it	1)
		•	titus affected by	•	()
			ergy is converted in		()
	4. Light travels in		orgy to convented in	to near energy.	,)
	5. Some animals	_			()
		oan ooo ar mg			,	
3	(A) Complete the	following senter	nces using the word	ls between brack	ets:	
	1. The speed of n	noving object =		(distance x time -	distance	e)
	2. Fish have				ills – lung	
	3. One of the light	t reflecting materi	ials is	(woo	od – mirr	or)
	4 is a	source of light.		(the Sur	n – the ey	ye)
	(B) Some dogs liv	ve in a cold envir	onment, while othe	rs live in a hot		
			which of them have		why?	
	***************************************		111711 (1411)	150 14414441411141110411041144444444	1111100 Bobishs sp	11114
	*** ***********************************	**>************************			******* >:* >** **	
			********* *** *** ***************	4111177117431411341175445		

Alexandria Governorate Choose the correct answer: 1. Which of the following is a source of light?..... d. Mirror. b. Moon. a. Eye. d. not flying 2. Bats are animals. c. not hearing 3. In the opposite figures which ball has the greatest potential energy? a. Figure (1). b. Figure (2). c. Figure (3). d. Figure (4). (3)(2)(1)4. The force that pulls the objects down toward the center of the Earth is d. wind c. water. b. pushing. a. gravity. 5. The force that slows down or decreases the speed of an objective d. puil. c. friction. b. gravity. a. push. Put () or (X): Foxes have strong hearing sense. 2. Wood is a transparent object that allows light to pass through it. 3. Food turns from complex to simple during the digestion process.

electrical energy. Choose from column (B) what suits it in column (A):

4. The chemical energy in a battery can be converted into

Column (A)	Column (B)
Camouflage a. it helps us to see.	
2. Smell	b. a type of adaptation that helps an animals to hide.
	c. ants use it to communicate,

4	(A)	Complete	the	followin	g se	entence	S :
	1.7	The differen	nt la	nguages	are	consid	er

ered as

2. During exhalation, gas comes out of the lung.

91

(B) Look at the following figures, then answer the questions:





Fig. (A) 1. Which figure represents a to		ig. (B)
2. Which figure represents an		(
62 White		\··
El-Qualyoubia Gover	norate Obo	ur Educational Zone
Choose the correct answer :		
The organ responsible for t	ne sight sense is	
	the nose.	d. the eye.
2. One of the behavioral adap		•
enemies	•	•
a. camouflage. b extincti	on. immigration.	d. reproduction.
3energy affects t	he sensory receptors in t	he eye, causing vision.
a. Sound b. Kinetic	c. Light	d. Magnetic
4. Animals can communicate	with each other through.	,111(*)**********
a. sound and lights.	b. talking.	
c. reading.	d. writing.	
5. The roots of palm plants he		
a. stand strong against the		
c. fixing plants in the soil.	d. all the previou	
6. The force that pulls the obj		d. wind,
a. gravity. b. pushin	g, c. water.	
7. The chemical energy store		
a. potential energy.c. heat energy.	þ. kinetic energy d. light energy.	fi .
	ប្ត. ប្រើប្រ មាមឡើរ	

3. Sending bad smells by Acacla tree is a behavioral adaptation.

Column (A)	Column (B)
1. Tapetum luc'dum	a. it is a common organ in the digestive and respirator
2. Pharynx	systems, dent role in the respiration
- Talyin	b. a muscle that has an important resources some. c. a structural adaptation in the eye provides some.
	c. a structurar adaptation at night,
1	2.
Complete the following	ing sentences from the two brackets:
1. destroys	the turns and causes many diseases.
	to have a second and the second and
2. The speed of a mo	ving object = (distance × time – dist
- Labella Harro Hong and	d strong hind legs that help them to jump quickly and es
in dangerous times. C	Determine the type of adaptation.
in dangerous times. C	Determine the type of adaptation.
in dangerous times. C	Determine the type of adaptation. Al-Hessinia Equation
in dangerous times. C	Determine the type of adaptation. Al-Hessinia Izer
Choose the correct a	Determine the type of adaptation. Al-Hessinia Equation in a large
Choose the correct at	Determine the type of adaptation. Al-Hassinia Formal Zone inswer: iral adaptations that helps the animal protect itself from
Choose the correct at 1. One of the behavior enemies	Al-Hessinia Izer Inal Zone nswer: ral adaptations that helps the animal protect itself from
Choose the correct at 1. One of the behavior enemies	nswer: extinction. c. immigration. d. reproduction.
Choose the correct at 1. One of the behavior enemies	Determine the type of adaptation. Al-Hessinia For adaptation in a protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except
Choose the correct at 1. One of the behavior enemies	Determine the type of adaptation. Al-Hessinia Isolation in all Zone inswer: ral adaptations that helps the animal protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except
Choose the correct at 1. One of the behavior enemies	Determine the type of adaptation. Al-Hessinia For adaptation in a protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except
Choose the correct at 1. One of the behavior enemies are camouflage. b. 2. All of the following a spinal cord. b. 3. Objects need a force.	Determine the type of adaptation. Al-Hessinia Fc. Iral adaptations that helps the animal protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except heart. c. nerves. d. brain. b. pulling only.
Choose the correct at One of the behavior enemies a. camouflage. b. All of the following at a. spinal cord. b. Objects need a force a. pushing only. c. pushing and pulli	Determine the type of adaptation. Al-Hessinia recipital Zone Inswer: I adaptations that helps the animal protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except heart. c. nerves. d. brain. b. pulling only.
Choose the correct at One of the behavior enemies a. camouflage. b. All of the following at a. spinal cord. b. Objects need a force a. pushing only. c. pushing and pulli Put (v) or (x):	Al-Hessinia Formal protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except
Choose the correct at One of the behavior enemies	Al-Hessinia Formal protect itself from extinction. c. immigration. d. reproduction. are components of the nervous system, except

3 Choose from column (B) what suits it in column (A):

1. Motion	a. A structural adoptation of
	A structural adaptation whose function is similar to the lungs.
2. Gills	b. A type of adaptation that helps an animal to hide.
3. Camouflage	c. The change in the position of an object with respect to a fixed point,

3. Camouflage	to a fixed point.	
# 4656(Wypqp)qubit@\$\$#*##!	2	3
4 Complete the fol	lowing sentences using	the words between brackets:
1. The time that t	he body takes to react to called	different information from the (reflex action – reaction time)
2. Bats use	as a means of com	munication with each other.
7 The ebility is		(sound – light)
3. The ability to d	o a work is called	(energy – gravity)
(A) Answer the f	ollowing questions	
1. A dolphin can Explain Why?	locate living organisms a	nd things under the surface of the water.
0 140		
Z. Wnen you sit (on the chair without movi	ng. What is the name of the force that

pulls you downward?

(B) Give a reason for the following:

The leaves of plants that float above the surface of the water are so wide.

10 El-Garbia Governorate

El-Santa Educational Zone

1 Choose the correct answer:

- 1. When a ball stands on the ground without moving, the forces acting on it are
 - a. balanced.
- b. unbalanced.
- c. push it up,
- d. not equal.
- 2. The chemical energy stored in batteries is considered a form of
 - a. kinetic energy.

b. potential energy.

c. heat energy.

- d. light energy.
- 3. The ability to do work is
 - a. force.
- b. energy.
- c. pull.
- d. push.

2 Choose from column (B) what suits it in column (A):

(A)	(B)	
1. Jerboa	a. it depends on the body's sense of heat for predation.	
2. Snake	b. it depends on the echo of the sound in locating the prey	
3. Bat	c. it depends on its hind legs to jump.	
1	2	
	3. non-re	
Put (✓) or (X):		
 Gravity pulls of 	bjects towards the center of the Earth.	(
In the electric f	fan, the kinetic energy is converted into electric energy.	(
		- (
When the rolle	r coaster slides down fast, its kinetic energy increases	,
(A) If the two car	rs moved at the same time for 20 seconds calcons causes.	(d
(A) If the two car a distance of	r coaster slides down fast, its kinetic energy increases.	_
(A) If the two car a distance of Which of the (B) Calculate the	rs moved at the same time for 20 seconds, car covered two cars has a higher speed? speed of a train that covers 600 km in a time of 6 hours.	ers.
(A) If the two car a distance of Which of the (B) Calculate the	rs moved at the same time for 20 seconds, car covered to meters, while car (B) covered a distance meters has a higher speed? speed of a train that covers 600 km in a time of 6 hours.	ers.
(A) If the two car a distance of Which of the (B) Calculate the Complete the fol	rs moved at the same time for 20 seconds, car covered to meters, while car (B) covered a distance meters has a higher speed? speed of a train that covers 600 km in a time of 6 hours.	ers.

3. The time that the body takes to react to different information from the

environment is called

(Eye - Heart)

(reflex action - reaction time)

11 Kafr El-Sheikh Governorate

Al-Hamoul Educational Zone

1 Choose the correct a					
1. Raising the thumb	up or lower it o	down is a kind of	f ,		
a. colors.	o. codes.	c. waves.	d. lights		
2. The organ respon	sible for the sig	ht sense is	61 (*))******		
a. the ear.	b. the tongue.	c. the nose.	d. the eye.		
3. One of the behavi	oral adaptations	s that help the a	nimal protect itself fron	n	
enemies	**				
a. camouflage.		b. extinction.			
c. immigration.		d. reproduction	on.		
4. An animal that has	s the ability to t	urn its head in a	Il directions is		
a. snake.	o. jerboa.	c. dolphin.	d. owl.		
5. When a body mov	es forward, the	change that oc	curs is in		
 a. the position of t 	he body.	b. the size of	the body.		
c. the mass of the	body.	d. the Earth's	gravity.		
3. Foxes have a strog4. In order for the co5. Force is the abilityMatch column (B) to	y to do work or	are , the brain m	nust identify it.	() _)
(A)		(B))		
1. Light	a. an animal	with a bowl-like	face.		
	b. it is the visi	ble form of energ	gy that is transmitted in	the	
2. Owl	form of way	ves.			
	c. it depends	on its hind legs	to jump.		
Terrorental and department with	2	-j+ -			
4 Complete the follow	wing sentences	from the two b	rackets :		
1is an o	paque object.		(Wood		ss)
2is the	organ that we c	an use to send	or receive a sound cod	0.	
			(Ear	r – Hea	art)
3 tree ha	as long and stro	ong roots to resis	st the water waves		
			(Palm - M	angro	ve)

12	El-Behira G	overnorate	Abou-Ho	mous Educational 2	one
11 c	hoose the correct a	nswer '			
	. Tapetum lucidum e		following, except	***************************************	
	a. the horse. b			d. the dog.	
2.	. Bats are				
			c. not hearing	d. not flying	
3	. When a body move				
	a. the position of th				
	c. the mass of the	body.	d. the Earth's gra	vity.	
4	. The force that slow	s down or decre	eases the speed o	f an object is	
	a. push. b	. gravity.	e. friction.	d. pull.	
2 P	'ut (✓) or (X) :				
1	. The ear is the sens	se organ which is	s responsible for s	eeing objects.	(
2	. Exhaled air carries	oxygen.			(
3	. In electric fan, the	kinetic energy is	converted into ele	ctric energy.	(
4	. Red and green trat	ffic lights are con	sidered codes		(
3 (Complete the follow	ling : c · . · · ·	r * + 5 ,	wets:	
	. If Noor travels with	·-			e is
	moving at a speed			(4m/hr. − 5	
2	2. What carries the me	essage from your	eyes to your brain		_
3	3. What kind of energ	ıv is stored inside	the battery?	(Nerves – N	nuscie)
,	, , , , , , , , , , , , , , , , , , ,	,, ,, ,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		ical energy – Heat ε	nemv)
4	4. The force that pulls	s things down is t			
4	Match column (B) to	column (A) :			
	(A)		(B)		
	1. Light	a. it depends on	its hind legs to Jur	mp,	
	2. Smell	b. it is the visible form of waves	form of energy tha	t is transmitted in the	

c. ants use it to communicate.

13 Beni-Suel Governorate

Beba Educational Zone

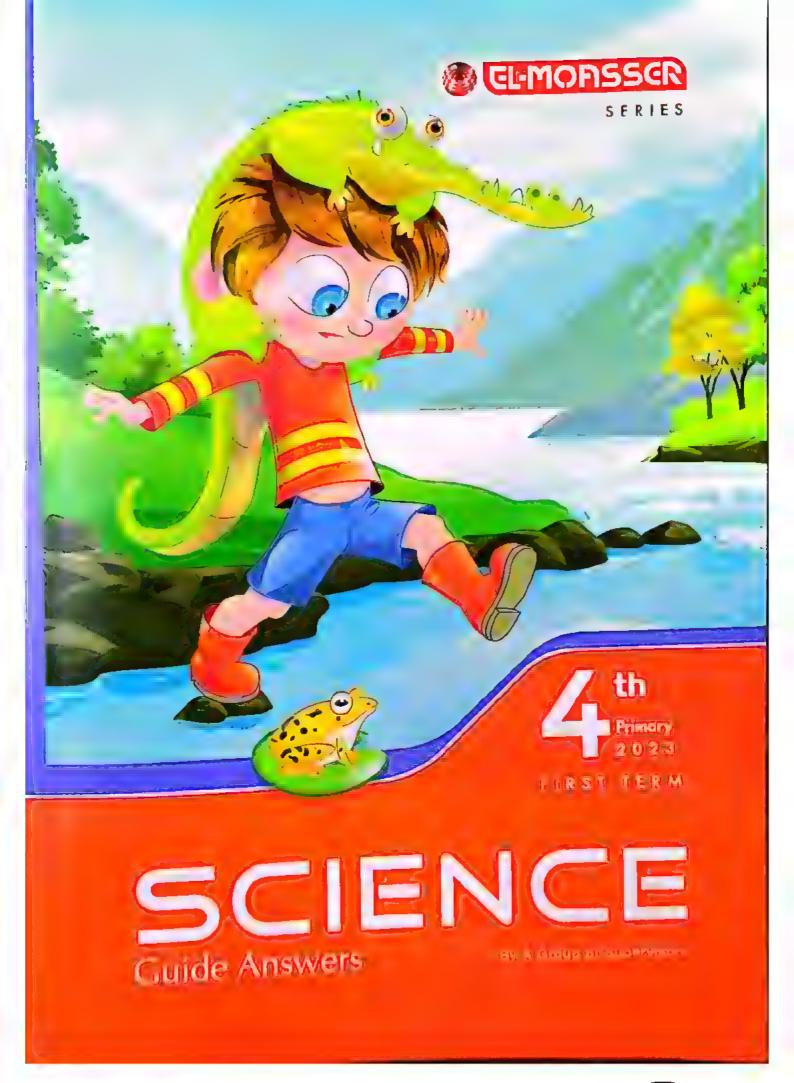
1 Choose the	correct and	swer :					
			rn its head in al	Il directions is			
a, snake.			ability to turn its head in all directions isboa. c. dolphin. d. owl.				
			1	n the eye, causir	sa sining		
a. Sound		Kinetic	c. Light				
			_	d. Magnetic except			
a, kicking		e examples u			* * 1		
_		o drower	b. pulling the				
			d. lifting up a				
4. A norse is at the san		n a numan, as	the numan cov	/ers a	distance		
a. less	b. (greater	c. double	d. twice			
5. Each of th	ne following	j is considere	d a source of lig	ght, except	#41>4+>4+>4		
a. the fire	. b. 1	he Sun.	c. the lamp.	d. the eye.			
2 Put (//) or (/	X):	_					
		sible for proce	ssing information	on.	()	
			hand, then the		,	•	
the gravity				•	()	
3. Dolphins	have a stro	ong signt sens	se.		()	
4. Energy is	neither de	stroyed nor co	reated from not	hing.	()	
		_	source of light		()	
3 Choose from	n column (B) what suits	it in column (A	A):			
(A)		(E	3)			
1. Motion		a. a muscle t	hat has an Imp	ortant role in the	respiration		
2. The spin	al cord	b. it gives a r	nessage to the	muscle to contra	act.		
		c. the ability	to do work.				
3. Diaphrag	jm	d. the change to a fixed p	e in the position	of an object wit	h respect		
4. Work		o the force t	hat causes the	body to move.			
5. Energy		f. electric en	ergy is convert	ed into kinetic en	ergy.		

4 Assiuc	Governorate	A	ssiut Educational Zone	
Choose the corre	avioral adaptation	s that helps the a	animal protects itself fro	m
enemies	P4+++++		d. reproduction.	
	b extinction.			
a. making a so	te through the sigh	b. availability		
c. hearing mus		d. touching so		
			ht, except	
a. the fire.	b. the Sun.		d. the eye.	
4. All of the follow		of pulling force	except	
a. kicking a bal	l.	b. pulling the		
_	desk's drawer.	d. dragging a	· ·	
5. The ability to de	o work is	u. dragging a	our toy.	
a. energy.	b. force,	c. push	d. pull.	
(A) Put (V) or (X)		Patoti	u. pull	
		andy decrease H	ne speed of this body	
increases.	are on a moving i	ody decrease, tr	ne speed of this body	,
2. The nervous sy	stem is responsib	le for breathing.		
3. Bats use their s	sense of smark type	word danners		(
Seeing with ou	r eyes is a war 🗥	neip us collect in	nformation Sout the	(
The second secon	Out Id ua.			(
(b) Calculate the	speed of a train t	hat covers 600 ki	lometers in a time of 6	hoi
***************************************	4444144444414444444444444	4		ПОС
(A) Choose from	column (B) what s	uits it in column	(A) ·	*****
(A)		(B)		_
1. Carbon dioxid	e a a das neces	sary for respiration		
2. Oxygen	b. a structural a	dantation where	on,	
	c. it helps us to	See.	on. function is similar to the I	ung
3. Gills	d. is a gas that	Is produced during	ng respiration process.	
* REMARKE PARTIES APPELLIANCES	2.	, and a doll	ing respiration process.	
(D) I			3	
(B) Look at the op	posite figure, the	n answer the que	Stion	
			*110[];	
a change in 6	nergy occurs from			
oneigy to man	energy,			

15 Sohag Governorate

Sohag Educational Zone

Complete the following sentences from the two brackets:	(carton – glass)
the onague objects	'
2. The amount of energy required to move an object through the called	(heart – ear) ense – sight sense) eathing – Pollution)
 Put (v) or (x): 1. Wood is a transparent object that allows light to pass through 2. The digestive system in animals breaks down food into simple 3. Animals digging holes are a form of structural adaptation. 4. Snakes have the ability to rough the about the ability to rough the according to a fixed proves. 5. When the position of the body the according to a fixed proves. 	()
Answer the following: 1. Which of the following consumes less fuel a truck or a small.	car?
When you sit on the chair without moving. What is the name	Of the second
a tall an world off Off the other	granda and and and and a second







UNIT ONE: Living Systems

Concept (1.1)

Exercises on Lesson 1

- 1 1.d 2.d 3.a 4.b 5.d 6.a 7.c 8 b 9.b 10 d 11 b 12.b 13.d
- 2 1. c→ B 2. d → C 3. a → D 4. b → A
- 3 1 (x) 2. (√) 3. (√) 4. (x) 5. (√) 6. (x) 7. (x)
- 4 1. hab tat
 - 2 predator prey
 - 3 adaptation
 - 4 camouflage
- 5 1 Adaptation.
 - 2. Penguin.
 - 3 Thick white fur.
 - 4 Fennec fox.
 - 5 Camouflage.
- 6 1. fat feathers.
 - 2. blood vessels
 - 3. black brown white
 - 4 fennec fox caracal
 - 5. starred agama ~ fennec
 - 6. warm white
 - 7. colorful scales
 - 8. penguin polar bear.
 - 9. predators camouflage

- 1. To keep its body cool during hot sunny days.
 - 2. To keep its body warm.
 - To keep its toes from freezing as the warm blood vessels heat up the cold blood vessels.
 - To hide among the colorful rocks in the desert.
 - 5 Fennec fox has a sandycolored fur to blend in with desert landscapes, while polar bear has a white fur to blend in with snow in polar region.
 - 6 Because camouflage helps some animals hide from their predators or preys in different environments.
- 8 1. The blood in the penguin's feet will be very cold so, the penguin cannot walk on ice and its toes may freeze.
 - It cannot adapt with the very cold weather in polar regions.
 - It cannot hide and hunt its preys in the desert environment.
 - They cannot hide from their predators or preys in their environments.

9 1.

P.O.C.	Penguin	Fennec fox	
1. Habitat :	Polar habitat	Desert habitat	
2. Body coat :	Dense feathers	Sandy- colored fur	

2.

P.O.C.	Polar bear	Forest bear
1. Habitat :	Polar habitat	Forest habitat
2. Fur color :	White	Dark

10 (b) and (d)

Exercises on Lesson 2

- 1 1. d 2. c 3. a 4. b 5. b 6. a 7. c 8. c 9. a 10. d 11. a 12. b 13. a 14. a 15. b
- 2 1. b → C 2. d → A 3. a → B
 - 4. 6 -> D
- 3 1. (√) 2. (×) 3. (×) 4. (×) 5. (√) 6. (√) 7. (√) 8. (√) 9. (√) 10. (×) 11. (×) 12. (√) 13. (√) 14. (×) 15. (×)

4

.Animal	its adaptation	Structural or Behavioral adaptation
1. Penguin	Has blood vessels weave around each other	Structural.
2. Polar bear	Has thick white fur.	Structural.
3. Arctic fox	Changes the color of its fur.	Structural
4. Fennec fox	Hiding inside burrows to stay cool.	Behavioral.
5. Panther chameleon	Has eyes face opposite directions	Structural.

- 1. Structural adaptation.
 - 2. Behavioral adaptation.
 - 3. Fennec fox. 4. Paneng.
 - 5 Arctic fox.
 - 6 Panther chameleon
 - 7. V-shaped feet
 - 8 Countershading.
- 6 t structural behavioral
 - 2 structural behavioral

- 5



- 3. fennec arctic
 4. fennec arctic
- 5. structural behavioral
- 6. arctic fennec
- 7. white brown
- 8 fresh salt
- 9. structural
- 10 structural
- 11 behavioral structural
- 7 1 To hide in a sandy, rocky environment.
 - To protect it from the hot
 Sun
 - 2. To cool its body
 - 3 To keep its body warm in extreme cold climate
 - 4 To help it sneaks up on prey in any season
 - 5 Burrow is an excellent place for
 - Fennec fox to stay cool
 during the sunny day
 - Arctic fox to stay warm at riight
 - 6. Extra-large ears help the feriner for to lose the heat to cool its truty, while short ears help the arctic for to stay ears.

- 7. Because other types of sharks live in salt water only.
- To hold tightly the branches of trees.
- 1. It cannot hide from its prey in winter or summer.
 - 2. It cannot cool its body.
 - 3. They cannot hunt.
 - It cannot sneak up on prey in summer season.
 - The panther chameleon cannot hunt its prey and avoid becoming a prey at the same time.
 - It puffs up its body with air, opens its mouth wide and changes the color of its scales.
- Fennec fox (all items live in cold regions, while fennec fox lives in hot regions).
 - 2 Buil shark (all items live on fand, while buil shark lives in water)
 - 3 Parither chameleon (all items have fur on their bodies, white parities chamilleon has scales on its body)

_		
	-	
_		
	•	
_		•

POC.	Fennec fax	Arctic lox
1. Habitat :	Hot desert	Cold desert
2. Color of fur :	Tan-colored	White during writer & brown in summer
3. Shape of ears :	Extra-large	Short
4. Time of entrance to burrows:	During the sunny days	Atroget

- 11 1. S 2. B 3 S 4 S 5. S 6 B
- 12 1. It pants like dogs to coor its body
 - 2 It searches for a shaded area during a hot surely day.
 - 3 It hunts during the day and at riight, so it can surprise its pray
 - 4. It putts up its body with air during danger
- 13 1 Areac tox It lives in hindre desert
 - 2 evinter burnmer
 - 3 To shook up on one in and shooker?

- 4 Structural adaptation of has short ears and legs to help it stays warm:
 - Behavioral adaptation (lives in burglins to stay warm at right.

1 t	2	C	3	0	4	4
5 0	6	C	7	<	8.	_
9 5	10	đ	17	C	12	2
13 0	14	C	15	*	16	
17 6	* 5	2	79	2	20	a
						-

- 2 to 2 e 3 f 4 a 5 :
- 5 (V) 6 (X) 7 X) 8 (V) 6 (X) 9 (X) 13 (V) 15 (V) 15 (X)
- 1 Assos the
 - Taprox
 - 3. Sharp spines
 - 4 AUDION THE
 - \$ 5,000 000
 - 6 TOUR
 - * Mangrove tree
 - Princip off selection []
 - 9 stage moves
 - to beauty waven
- S A ALLEY ALC.
 - 4 25025

- 5. acacia tree Palm tree parbary fig plant.
- 6. acacia pine
- 7. float sunlight
- 8. water roots.
- 9. mangrove palm
- 10. water lily kapok
- 6 1. To prevent animals from reaching its leaves to feed on.
 - 2. To prevent animals from eating these leaves
 - 3. Because acacia tree uses wind to send smelly message to acadia trees nearby telling them to start making a poisonous substance.
 - 4. To allow wind to move more gently through the leaves without tearing them.
 - 5. Due to presence of large, wide roots called buttress roots.
 - 6. To allow the snow slide easily over it, so its branches don't break
 - 7. To absorb a large amount of sunlight.
 - 8. To resist the water waves.
 - 9. To resist the strong winds
 - 10. To prevent animals from eating its fruits and leaves
- 1. It can't search for water in the deep soil 8,

- 2. Animals can eat these leaves easily
- 3. Kapok tree can't stay firmly in soggy soil.
- 4. The snow can't slide easily over its branches and the branches break down more easily.
- 5. The sunlight can't reach these plants easily.
- 6. It can't absorb a large amount of sunlight.
- 7. It can't resist the strong winds
- 8 1. Buttress roots (all items belong to acacia tree, while buttress roots belong to kapok tree).
 - 2. Taproot (all items belong to kapok tree, while taproot belongs to acacia tree).
 - 3 Mangrove tree (all items live in desert habitat, while mangrove tree lives in salt water habitat).
 - 4. Acacia tree (all items live in snow habitat, while acacia tree ilves in savannah habitat).

9 1.

P.O.C.	Acacla tree	Kapok tree
1. Type of roots ;	Taproot	Buttress roots
2. Shape of leaves :	Tiny leaves	Hand- shaped leaves

P.O.C.	Kapok tree	Water lily plant	Pine tree
1. Habitat:	Rainforest	Wetland	Snow
2. Shape of leaves :	Hand- shaped leaves	Wide	Needle leaves

10 1. wetiand leaves sunlight. 2. long winds

palm

3. snow short water.

44

Organisms live in deserts	Organisms live in forests	
- Starred agama		
lizard.	- Panther	
- Fennec fox.	chameleon.	
- Palm tree.	- Kapok tree.	
- Barbary fig plant.		

- 4. C 1. d 2. b 8. a 6. d 7. d 12. d 11. 0 10, b 9. c 16. b 14. d 15. C 13. b 20 b 19. d 17. a 18. b 24 b 23. d 22. G
- 3. 3 2, 1, d 2, c

- 3. (×) 4. (×) 5. (x) 6. (x) 7. (x) 8. (√) 9. (×) 10. (√) 11. (√) 12. (×) 13, (✓) 14, (×) 15, (×) 16, (✓) 17. (×) 18. (√)
- 1. Digestive system.
 - System.
 - Digestion process.
 - 4. Mouth.
- 5 Teeth.
- 6. Saliva.
- 7. Stomach.
- B. Small intestine.
- 9. Anus.
- 10 Esophagus.
- Respiration process.
- Alveoli.
- 13. Diaphragm.
- 5 1. digestive respiratory
 - 2. teeth tongue
 - stomach small intestine.
 - 4. esophagus smaii intestine
 - 5. small intestrie.
 - 6. liver pancreas
 - 7. blood vessels.
 - 8. small large
 - 9. respiratory
 - 10 bronchioles alveoli.
 - 11. trachea.
 - 12. diaphragm
 - downward upward.
- 1. To perform different functions.
 - 2 Because they help in breaking down food into nutnents.
 - 3. Because solid wastes leave the body through it

- Because the inhaled air is rich in oxygen gas, while the exhaled air is rich in carbon dioxide gas.
- Because it contracts and moves downward during inhalation to increase the size of chest, while it relaxes and moves upward during exhalation to decrease the size of chest.
- The digestive system could not do its function correctly.
 - The blood carries these nutrients to all the body parts.
 - The size of chest increases, the air rich in oxygen gas enters the lungs.
 - The size of chest decreases, the air rich in carbon droxide gas comes out of the lungs
- 8 1. Saliva (all items are organs through which food passes in the digestive system, while saliva is a juice that is secreted to help in digestion of food).
 - Lungs (all items belong to the digestive system, while lungs belong to the respiratory system).
 - Anus (all items belong to the respiratory system, while

- anus belongs to the digestive system).
- Organ (1): Esophagus.

Organ (2): Small intestine.

Organ (3): Large ntestine,

Organ (4): Trachea,

10

P.O.C.	Inhalation	Exhalation
1. Diaphragm movement :	downwards	upwards
2. Size of chest cavity :	encreases	decreases
3. The air is rich in :	oxygen gas	carbon dioxide gas

11

	The areas	The system	
The organ		Digestive	Respiratory
	1. Trachea		1
	2. Anus	1	
	3. Stomach	1	
	4. Lungs		1
	5. Small intestine	1	
l	6. Esophagus	1	
	7. Diaphragm		1
	8. Nose		1
	9. Large intestine	1	
	10. Liver	V	
	11. Pancreas	1	

- 12 1 Mouth saliva
 - 2. Esophagus stomach.
 - 3. Stomach stomach digestive
 - Small intestine pancreas liver – nutrients.
 - Large intestine water undigested
 - 6. Anus wastes.
- 13 (1) Nose.
- (2) Throat.
- (3) Trachea.
- (4) Two bronchi.
- (5) Bronchioles. (6) Alveoli.
- 7 Two lungs. 8 Diaphragm.
- 14 (1) a
- (2) b
- (3) diaphragm increases
- (4) carbon dioxide

- 11 1.c 2.d 3.c 4.b 5.d 6.b 7.d 8.d 9.d 10.a 11.c
- 2 1.d 2.a 3.c
- 3 1, (x) 2, (x) 3, (x) 4, (\sqrt{)
 - 5. (x) 6. (\sqrt) 7. (x) 8. (x)
 - 9. (1) 10. (1) 11. (1) 12. (1)
 - 13. (x) 14. (\sqrt) 15. (\sqrt)
- 1. oxygen gas 2. Water
 - 3. oxygen gas
 - 4. structural adaptation
 - 5, rapidly
- Wildfires
- 7. animals, plants and humans
- 8. Air pollution

- 5 1. Gills.
 - Oxygen gas.
 - Carbon dioxide gas.
 - 4. Water pollution.
 - Air pollution.
- 6 1. lungs gills 2. blood
 - 3. structural
 - 4. strong wind wildfires
 - 5. air water 6 pollution.
 - 7. smog.
 - 8. damage of lungs asthma
- Because they enable fish to extract oxygen gas from water for resoiration.
 - Because rapid changes may cause death or disappearance or even extriction of some fiving organisms, while slow changes give a chance for organisms to adapt to survive.
 - Because they produce smog which causes damage of lungs, asthma and heart diseases.
 - To decrease air pollution.
- 8 1, Living organisms will be able to adapt over time to survive
 - Living organisms may die, disappear or even become extent.
 - The pollution of air, water and soil will increase.

water to drink and fish cannot found clean water to breathe. 5 Humans cannot found clean

9 1.c

Exercises on Lesson 6

4, d 10. d S Si 6.6 9. D

₹. ? 8.6 2.5 2 1. (v) 2. (x) 5. (x) 6. (v)

3 1. Amphibians, 2. Skin.

3. Oxygen gas.

4. Structural adaptation.

5. Lung

4 1. reptile - amphibian.

5. decreases 3. gills - lungs - skin

6. lungs - skin. 7. structural

8. carbon dioxide gas 9. air - water

5 1. water.

6. amphibians. 3. an amphibian. 4. lungs 5 oxygen gas 7. Amphibians

6 1. Because skin of frog can absorb oxygen gas directly from water, while fish cannot.

wet all the time, to be able to Because their skin must be extract oxygen gas directly from water.

oxygen gas from water and alr. Because they breathe in To help them survive. 7 1. The number of amphibians will

decrease

2. Amphibians will survive and their numbers increase. 3. They can live only under water

 The number of amphibians will decrease.

Salamanders can live on land

6 They cannot survive.

8 1. (x) 2. (v) 3. (v)

Medial Evaluation Semespi (1.1)

1 (A) 1.d

to extract oxygen gas from (B) Because they enable fish water for respiration.

2 (A) 1. (x)

(B) The size of chest decreases. the air rich in carbon dioxide gas comes out of the lungs.

2. Amphibians 3 (A) 1. Wildfires

3. oxygen gas

4. Water lily plant

like salt water or fresh water. (B) It hunts in different places

4 (A) 1. Thick white fur.

Countershading. 3. Mangrove tree.

4 Anus

while acacra tree lives in (B) 1. Acacia tree (all items live in snow habitat.

2. Bull shark (all items live on land, while bull shark lives in water

savannah habitat).

Concept (1:2)

1.0

Exercises on Lesson (1)

2 1. (x) 2. (v) 3. (v) 4. (x)

5.(x) 6.(v)

4. Touch 2. Eyes. 3 1. Echolocation

4 1. smell - hearing

3. hearing - echolocation 2. hearing

5 1. hearing.

one place to another or when 6 1. To communicate with other mongooses to move from searching for food

them able to find their preys in hearing and sight that make extraordinary senses of 2. Because owls have the dank, Because dogs have very sharp Beczuse dolphers have super senses of hearing and smelt

sense of hearing, so they can hear all kinds of sound

the dolphin can detect the location 7 The sound waves bounce back to the dolphin in the form of echo so, of this object.

(1) The sound produced by a dolpnin ..

(2) The sound waves travel and he the prey ...

(3) The echo heips the cootin-

7 1. b

Exercises on Lesson

- G

- 9.d 10 d 11.a 12 d 13.d 14.d 15.c 16.d
- 2 (1) 1.d 2.a 3.b (2) 1.d 2.e 3.a 4.c
- 3 1. (x) 2. (x) 3. (√) 4. (x) 5. (√) 6. (x) 7. (x) 8. (x) 9. (√)
- 4 1. Nocturnal animals.
 - 2. Snake,
- 3. Echolocation.
- 4. Owl.
- 5. Nervous system
- 6. Brain.
- 7. Spinal cord.
- 8. Sense organs.
- 9. Sensory receptors.
- 5 1. heat echolocation.
 - 2. dolphins bats.
 - 3. hearing sight.
 - 4. head eyes
 - 5. spinal cord.
 - 6. electrical impulses
 - 7. eyes brain,
- 6 1. tasting
- 2. backbone.
- 3 echolocation, 4, brain.
- 5. stronger
- 7 1. Because the weather becomes cool at night in these regions
 - To locate their preys at night through sensing their body heat

- To pick up and amplify distant sounds then direct these sounds into the owls' ears.
- 4 Because snakes have the ability to sense the heat of the preys' bodies by using a special body part in their faces.
- 8 1. It cannot sense the heat of its preys body at night, so it cannot hunt at night.
 - 2. They cannot hunt at night.
 - They cannot search for preys everywhere, but in one direction only.
- 9 a. The nervous system.
 - b. 1 Brain.
- 2 Spinal cord.
- ③ Nerves.
- c. 1. (2)
- 2.①
- 3. (3)

- 11.d 2.c 3.a 4.a
- 2 1.(*) 2.(*) 3 (\$\sqrt{1}\$) 4.(\$\sqrt{1}\$)
 - 5. (x) 6. (\sqrt{)} 7. (x)
- 1. Egyptian jerboa.
 - 2. Reaction time.
 - 3. Nervous system
 - 4. Brain.
- 4 1. behavioral 2. structural
 - 3. hearing ears.

- hind legs catch sand when it jumps.
- 5. ears brain 6. reaction time.
- 5 1. quickly. 2. hair.
 - 3. nervous 4. structura!
- 1. Because it has long hind legs that make it jump for long distances
 - To help it grip the sand when it jumps.
 - Because it has large and sensitive ears, so it can detect even a quiet snake.
- The hand will move quickly away in less than one second
 - It hops in zigzag patterns, so it can escape quickly from danger.
- 8 a. Structural adaptation.
 - b. Sandy color of jerboa helps it hides easily in sandy environment, so it can sneak up on its preys and hide easily from its enemies.
- (1) A jerboa hears
 - (2) The sensory receptors that found.
 - (3) The brain processes _ ...
 - (4) The brain alerts the jerboa's legs.
 - (5) The jerboa jumps

- 1 1.b 2.a 3.a 4.b
- 21 c 2 e 3.d 4.a
- **3** 1. (x) 2. (x) 3. (√) 4. (√)
- 4 1. brain. 2 nerves 3. sensory receptors
- 5 1. faster 2. Nerves 3. hand – brain 4. tongue 5. faster
- Because the ears sent
 a signal to the brain to avoid
 being hit by a car.
 - Because the ears sent a signal to the brain that processes the information and transmits a message to the leg muscles to run.
- 7 1. The prey may run away from the snake.
 - The jerboa will be eaten by the snake.
 - 3. The cup may be broken.
 - 4. The bat may hit the wall.
- 8 (1) Hearing the whistle
 - (2) The nerves of the ears
 - (3) The brain processes
 - (4) The brain sends a signal

Maha, because the brain can process the messages from the eyes faster than the messages from the ears.

Exercises on Lesson 5

- 11 1. d 2. a 3. b 4. a 5. d 6. c
- 2 1. (√) 2. (√) 3. (√) 4. (×)
- 3 1, Nerves. 2, Taste. 3, Reflexes.
- 4 1. nose 2. brain
 3. reflexes.
 4. sensory receptors brain.
 - 5 ear nose 6. ears - brain
- 5 1. sensory receptors
 - hearing.
 brain
- 1. Eyes all items are senses, while eyes are sense organs).
 - 2. Taste (all items are sense organs, while taste is a sense)
 - Lungs (all items belongs to the nervous system, while lungs belong to the respiratory system).
- Because ears receive the different sounds and transmit them to the brain to be

- processed, so brain can determine the type of music.
- Because it is the main control center of the body.
- 8 1. Messages cannot be transmitted between brain and body parts.
 - Brain cannot process what s seen by the eyes.
- 9 1. nervous 2. 2 – 3 – 1
- 10 1. 1, 5 2. 3, 6 3. 2. 4

Model Exam on Concept (1.2)

- 1 (A) 1. a 2. a 3 d 4. c
 - (B) To help it jump long distances
- 2 (A) 1. ears 2. brain 3. hearing. 4. weaker
 - (B) They cannot search for preys everywhere but in one direction only.
- (A) 1. Reaction time. 2. Taste.
 - 3. Nervous system.
 - 4. Brain.
 - (B) 1. Nerves.
 - 2 Spinal cord. 3. Brain.

- (A) 1. nose 2. faster
 3. behavioral
 4. hearing sight.
 - (B) (1) Hearing the whistle ...
 - (2) The nerves of the ears ...
 - (3) The brain processes . .
 - (4) The brain sends a signal ...

Concept(4:3)

- 1 1. b 2. c 3. d 4. c 5. d 6. b 7. d 8. c
- 2 1. (\$\sqrt{}\) 2. (\$\sqrt{}\) 3. (\$\sqrt{}\) 4. (\$\sqrt{}\) 5. (\$\sqrt{}\) 6. (\$\sqrt{}\) 7. (\$\sqrt{}\)
- 3 1. light 2, mirror-like 3, sources of light.
 - 4. bounce
- 4 1. Eye. 2. Fishing cats.
 - 3. Sources of light.
 - 4. Brain. 5. The Moon.
 - 6. Night vision goggles.
 - 7. Light.
- 5 1. different
 - 2. light energy.
 - 3. Sun
 - 4. nervous system.
 - 5. back
- 6. Light
- 7. brain
- 8. black

- 6 1. sight heat 2. light sound
 - 3. structural 4. reflect
 - 5. candies mirror the Moon.
 - 6. structural behavioral
- 7 1. Because it has a mirror-like membrane on the back of its eyes which bounces off the light.
 - 2. Because it gives off their own light.
 - Because it does not give off its own light, but it reflects the light.
- 1. Fishing cat can't see at night.
 - It seems to be dark and we can't see it.
 - Their eyes cannot be affected by light, so they cannot see.
- The Moon (all items are sources of light, while the Moon is reflecting the light).
 - Candle (all items are reflecting the light, while candle is a source of light).
- 10 1. Sense of sight.
 - Sense of sight and sense of hearing.
 - 3. Sense of hearing.

- 1 1.b 2.b 3.b 4.c 5.b 6.c 7.d 8 d 9.c 10 b
- 2 1. e 2. c 3. a 4. d
- 3 1. (√) 2. (√) 3. (*) 4. (√) 5. (*) 6. (√)
- 4 1. Noctumal animals.
 - 2 Tarsier.
- 5 1. strong 2. bigger
 - 3. Tarsier 4. owl
- 6 1. smaller wider
 - 2 hearing touch smell.
 - 3. eyes fishing cat
 - 4. owl sockets.
 - 5. light nocturnal
 - 6. hearing sight.
 - 7. owl tarsier fennec
 - 8. owl tarsier panther chameleon
- Because nocturnal animals have bigger eyes which are more sensitive to light than human and their pupils usually open wider than human.
 - Because they can turn their heads 180 degrees.
 - To gather and reflect any light available to give them a picture of their surroundings.

8 They can't see in all directions

Exercises on Lasson 3

- 1.b 2.a 3.a 4.d
- 2. 1. (×) 2. (√) 3. (√) 4. (√)
- 1. Eyes.2. Tapetum lucidum.
- 4 1. tapetum lucidum,
 - 2. structural
 - tapetum lucidum –
 echolocation
 - 4. reflects
- 5. laht
- 6. hearing sight
- 7. light sound ears
- 1. Because it reflects light ike a mirror, allowing the eye to collect more available light.
 - 2. Because eyes of human don't contain tapetum lucidum.
- The eyes of snakes will glow at night and they get excellent night vision.

Exercises on Lesson 4

- 1 1.c 2.d 3.b 4 d 5.c 6.d 7.b 8 a
 - 9. c

- 2 1, e 2. g 3. d 4. a
- 1. (*) 2. (*) 3. (\$\sqrt{}\$) 4. (\$\sqrt{}\$) 5. (\$\sqrt{}\$)
 - 1. Transparent materials.
 - 2. Opaque materials.
 - 3. Rough surface.
- 5 1, reflection 2. Transparent
 - 3. Smooth
- 6 1. straight 2. waves.
 - 3. opaque transparent
 - 4. opaque light
 - 5. rough light
 - 6. metal opaque don't allow
 - 7. less
 - 8. transparent glass lenses
- 1. Because the opaque body doesn't allow light to pass through.
 - Because the glass cup is considered a transparent material which allows light to pass through.
 - Because the mirror is more smooth than the painted surface.
- 8 1. Light can't pass through the opaque object to the wall, so shadow of the object is formed on the wall.

- Light passes through the glass window.
- Light rays are reflected in different directions.
- 9 (1) Light rays bounce off
 - (2) The reflected light travels
 - (3) Special nerves in the eyes
 - (4) The brain interprets
- 10 1, a. smooth surface.
 - The rays are reflected at the same angle at which they strike the object originally.
 - b. rough surface.
 - The rays are reflected in different directions.
 - c. straight
 - 2. c

11

Smooth materials	Rough materials	
· Mirror.	- Prece of cloth.	
- Metal.	- Wood.	
	Paper.	

12

Opaque objects	Transparent objects
- Wood	• Air.
- Metal	· Water.
	- Lenses

Madel Examon Concept (1.3)

- (A) 1, d 2, c 3, b 4, c
 - (B) Because the glass is considered as a transparent material, which allows light to pass through.
- 2 (A) 1. (★) 2. (√) 3. (√) 4. (√)
 - (B) Light rays will reflect in different directions.
- (A) 1. brain eyes
 - 2. vision hearing
 - 3. noctumal reflects
 - 4. rough light
 - (B) 1. The Moon (all items are sources of light, while the Moon reflects the light).
 - Dolphin (all items are using their excellent night vision to hunt, while bat is using echolocation to hunt)
- (A) 1. Sources of light.
 - 2. Tapetum lucidum.
 - 3. Transparent objects.
 - 4. Light.
 - (B) Fishing cat depends on vision, because it has tapetum lucidum which reflects light to see more at night

- Bat depend on echolocation, because it has poor night vision,

Concept (1.4)

Exercises on Lesson

- 1 1.c 2.d 3.d 4.d 5.a 6.a 7.c
- 2 1.c 2.b 3.d
- 3 1. (\(\sigma\) 2. (\(\sigma\) 3. (\(\pi\) 4. (\(\sigma\) 5. (\(\pi\)) 6. (\(\pi\))

2. humans.

- 4 1. chemical
- 1. sight hearing.
 - 2. communicate a mate
 - 3. chemical reaction
 - 4. flash pattern
 - 5. language speech.
 - 6. hearing sounds
 - 7. sight hearing.
 - 8. hearing dolphins bats.
 - 9. reading writing.
- 10. movement displaying light.
- 6 1. To communicate with each other
 - To warn off their predators or to attract a mate
 - 3. To light up their bodies and communicate with each other

- The fireflies imitate the flashing pattern that the person made.
 - It produces a chemical reaction inside its body to light up and attract a mate.

8

Rems	Light	Sound	Both
1. Car lamps.	1		
2. Television.			1
3. Traffic lights.	1		
4. Radio.		1	

9 1.(√) 2.(√) 3.(x) 4.(√)

Exercises on Lesson

- 1 1.a 2.d 3.d 4.d 5.b 6.c 7.c 8.b
- 2 1.b 2.a 3.d 4.e
- 1.(\(\sigma\) 2.(\(\mathbf{x}\) 3.(\(\sigma\) 4.(\(\sigma\) 5.(\(\mathbf{x}\)) 6.(\(\sigma\))
- 1. different 2. summer.
 - 3. High
- 4. different
- 5. fast
- 5 1. Winter, 2. Summer.
 - 3. High-pitched sounds.
 - Low-pitched sounds.
 - 5 Ear.
- 6 Eye
- 7 Code

- 1. hearing notes (tones) songs.
 - 2. high cold
 - 3. summer law
 - 4. sound light
 - 5. fight sound
 - 6. hearing 7. sight
- Because high-prizhed sounds travel better through cold water
 - To communicate with each other in different seasons.
 - To give a specific meaning according to the arrangement of letters in a word.
 - To help people predict our feelings.
- 8 1. They cannot communicate by songs using their hearing sense.
 - The eyes send a message to my brain to stop walking and not cross the road.
- 9 1. (2) 2. (1) 3. (2) 4 (1) 5. (1) 6. (2)

- 1 d 2.c 3.d 4 b 5 b
- 2 (V) 2 (V)

- 1. Morse code. 2. Dots 3 Dashes.
- 4 1. communication sound light
 - 2 short ong
 - 3 dashes dots.
 - 4. sight hearing
- 5 1 A 2 D 3 A 4 P 5 T 6 A 7 T 8 I 9 O 10 N 13 adaptation.

- 1 1.c 2.d 3.a 4.a 5 b 6 c 7.d
- 2 1. d 2. c 3. b
- **3** 1. (√) 2. (*) 3. (*) 4. (x)
- 1. (√) 2. (*) 3. (*) 4. (*)
- 4 1. food 2. eight 3 sight. 4. different
 - 5. Soldær
- 5 1. Scout bees. 2. Sight. 3. Ants. 4. Nurse ants.
- 6 1. food water 2. wings code
- 3. sign language.
 - 4. nurse scout soldier
 - 5. smell movements
 - 6. smelly
 - 7. acacia
 - 8. sight
- To communicate with other bees to find food and water resources.

- 2. To alert the scout ants that the food is low.
- To communicate with the other ants in case of danger,
- They cannot communicate to reach to the location of food and water resources.
 - 2. He cannot communicate with the other people.
 - They cannot communicate with each other by smelly messages.
 - The nurse ants send smelly messages to scout ants to alert the ants where to find the food.
 - The soldier ants send smelly messages to alert the other ants that there is a danger nearby.
- 9 1. (2) (1) 2. (1) 3. (2)

Exercises on Lesson [5]

- 1 1. d 2. d 3. a 4. a 5. d
- 2 1. (x) 2. (x) 3. (\sqrt)
 4. (x) 5. (x)
- 3 1. Bat.
 - 2. The special cane of blind people

- 1. echolocation
 - wings vibrations
 - 3, vibrations
- 1. To tell the blind person where objects are around him.
 - Because their special canes emit a high-pitched sound that human's ears carriot hear it.
- 1. It bounces back to the cane in the form of echo which is turned into vibrations.
 - They cannot communicate with each other or locating the objects by the sense of hearing.
 - The cane will make vibrations that tell the blind person that there is a wall in front of him.
- Honeybees (All items can communicate by sounds while honeybees can communicate by flash lights).
 - Firefiles (All items use echolocation in communication white firefiles use flash lights in communication).
- 8 t, (t) (2) 2 (t) (3)

9

	Devices	Inspired from the adaptation of	
	1. Blind people cane.	Bats.	
l	2. Night vision goggle.	Cats.	

Model Exam on Concept (1.4)

- 1 (A) 1. d 2.c 3.b 4.1
 - (B) Because bats use sound to :
 - Communicate with each other.
 - Get information about their surroundings using their hearing sense.
- 2 (A) 1. (V) 2. (X) 3. (X) 4. (X)
 - (B) The nurse ants send smelly messages to scout ants to alert the ants where to find the food.
- 3 (A) 1, sight hearing.
 - 2. summer low
 - 3. high-pitched
 - 4 bees ~ smell
 - (B) 1 b 2 a
- (A) 1 Blind people care.
 - 2. Nurse ants.
 - 3. Code. 4. Dots.
 - (B) 1 b 2 a 3.d

UNIT TWO: Matter and Energy

Concept (2:1)

Exercises on Lesson 1

- 1 1.a 2.c 3.a 4.i
- 2. (x) 2. (√) 3. (√) 4. (x) 5. (x) 6. (√) 7. (√)
- 3 1. Pulling force.
 - 2. Pushing force.
 - 3. Shockwave truck.
- 4 1. force 2. move.
 - 3. jet parachutes
 - 4. rocket. 5. move stop
 - 6. shockwave rocket
- 5 1. Because the shockwave truck has three jet engines.
 - 2. To stop the shockwave truck.
- 6 1. It starts to move on the ground.
 - It turns into shockwave truck and moves with high speed.
 - The shockwave truck starts to stop gradually.
- 7 1. (2) (1) 2. (2) - (1) 3. (2)

Exercises on Lesson 2

- 1 1.c 2.a 3.a 4.b 5.b 6.c 7.d 8.d 9.d 10.b
- 1. (\$\sqrt{}\) 2. (\$\times\) 3. (\$\times\) 4. (\$\sqrt{}\) 5. (\$\times\) 6. (\$\times\) 7. (\$\sqrt{}\) 8. (\$\times\)
- 1. Pushing force.
 - 2. Pulling force.
 - 3. Motion.
 - 4. Gravity.
- 4 1. leaves fire extinguishers
 - 2. speed
 - 3. push pull
 - 4. pulling
 - 5. balanced
 - 6. pushing
 - 7. motion.
 - 8. gravity.
 - o. gravity.
 - 9. pushing pulling
 - 10. fixed
- 5 1. decreasing
 - 2. pushing
 - 3. pulling
 - 4. unbalanced
 - 5. changing
- Due to the pushing force of your leg that acts on it.

- Because the two forces are balanced, so the object doesn't move.
- Due to the pulling force of gravity down toward the Earth.
- Due to the pushing force of his hand against the ball that make it stop.
- 7 The rope will not move because the two forces are balanced.
- 8 1. It will move faster.2. 1. (✓)2. (×)
- 1. Pushing force.
 - 2. Pulling force.
 - 3. Pulling force.
 - 4. Pushing force.
- 10 Answer by yourself.

Exercises on Lesson 3

- 1 1. b 2. b 3. b 4. c 5. b 6. b 7. c
- 2 1. (\(\sigma\) 2. (\(\pi\) 3. (\(\sigma\) 4. (\(\pi\) 5. (\(\sigma\) 6. (\(\pi\))

2. pull

- 1. gravity
 - opposite
 - 4. decreases.
 - 5. friction

- 4 1. Force.
- Friction.
- 3. Friction.
- 1. pulling pushing
 - 2. balanced
 - 3. pulling pulling
 - 4. friction
- gravity.
- 6. friction opposite
- 6 1. Because the wall applied a force to the car with the same amount of the force that pushes the car towards the wall.
 - Due to the friction force between the bicycle tires and the road that act in the opposite direction of the bicycle movement.
- 1. It will fall down on the ground due to the pulling force of gravity.
 - It will move for a certain distance then it starts to stop gradually due to the friction force between the ball and the ground.
- 8 1. Balanced. 2. Unbalanced.
- 9 1.d 2.b

- 1 1.d 2.a 3.c 4.d
- 2. 1. (✓) 2. (✓) 3. (※) 4. (※)
- 3 1. long short 2. force larger 3. longer 4. greater
 - 5. longer
- Due to the difference in the forces that act on each of them.
 - Because the small object travels faster than the bigger object when the same amount of force acting on them.
- 5 The ball that is affected by the greater force will move a longer distance than the other ball.
- 6 1. Car (A), because it travels a longer distance than car (B) 2. 1. c 2. b 3. d

Exercises on Lesson 5

- 1 1.c 2.a 3,d 4.a
- 2 1. (√) 2. (×) 3. (×) 4. (×)
- 1. energy 2. energy – work
 - energy work
 energy 4, more
- The second player, because he raises a weights heavier than

the first player, so he need large amount of energy to do more work

Model Exum on Concept (2-1)

- (A) 1, c 2, d 3, d 4, b
 - (B) The rope will not move, so their is no winner team.
- 2 (A) 1. (*) 2. (√) 3. (*) 4. (√)
 - (B) Due to the friction force between the pen and the table surface that act in the opposite direction of the pen movement.
- 3 (A) 1, increase. 2, force 3, friction 4, more
 - (B) Pulling force : 2 6- Pushing force : 1 3 4 5
- 4 (A) 1. long 2. opposite 3. jet engines
 - 4. balanced
 - (B) 1. parachute
 - 2. Shockwave truck rocket.

Concept:(2.2)

Exercises on Lesson 1

1 1.a 2.b 3.c 4.a 5.d 6.b 7.d 8.c

- 7 1.c 2.d 3.a
- 3 1. (√) 2. (×) 3. (×)
- 1. Kinetic energy.
 - 2. Kinetic energy.
- 1, increases.
 - 2. pulling force
 - 3. Kinetic.
 - 4, pulling force
 - 5. stop.
- 1. electric motor electricity.
 - 2 less
- 3. decreases.
- 4. electrical kinetic
- 1. Because its stored energy changes into kinetic energy, that helps it moves downward.
 - 2. Because its kinetic energy increases.
- 1. Its stored energy changes into kinetic energy.
 - 2. It can't move, so it will stop.
 - Its stored energy changes into kinetic energy.
- 9 1.b 2.d 3.c

Exercises on Lesson 2

1 1.b 2.d 3.b 4.b 5.c 6.b

- 2 1.f 2.d 3.b 4.e 5.c
- 3 1. (\$\sqrt{}\$) 2. (\$\pi\$) 3. (\$\sqrt{}\$) 4. (\$\sqrt{}\$) 5. (\$\sqrt{}\$) 6. (\$\sqrt{}\$) 7. (\$\pi\$) 8. (\$\sqrt{}\$)
- 4 1. Potential energy.
 - 2. Kinetic energy.
 - 3. Energy.
- 4. Work.
- 5. Potential energy.
- 5 1. kinetic
 - 3. light 4. kmebc
 - 5. potental
- 5 1, energy.
- 2. work.
- 3. kinetic
- 4. potenbal

2 work

- 5. light sound thermal
- 6. potential
 - increase.
- 8. decrease.
- Because the kinetic energy of the ball transfers to the goal net.
 - Because the bird is found at a height from the Earth's surface, so it has potential energy.
 - Because its height from the Farth's surface increases.
- The object has potential energy.
 - The potential energy of the apple changes into kinetic energy.

- The potential energy of the book will increase.
- 9 1, c 2, a
- 10 1. a 2. b
- 11 1. potential kinetic 2. potential

- 1 1.d 2.c 3.d 4.d 5.c 6.b 7.c 8.c 9.c
- 2 1. b 2. f 3. d 4. a 5. c
- 5. (*) 2. (√) 3. (√) 4. (*) 5. (*) 6. (*) 7. (√) 8. (√)
- 4 1. Chemical energy.
 - 2. Light energy.
 - 3. Thermal kinetic energy.
 - 4. Gravitational potential energy.
- 1. kinetic.
 - 2. thermal kinetic.
 - 3. decreases 4. sound.
 - 5 potential 6 Gas oven
- 6 1. gravitational chemical sound
 - 2. gravitational 3. kinetic
 - 4. light sound
 - 5. sound mechanical

- 6. electrical sound
- 7. light thermal
- 8. chemical thermal
- 9 potential kinetic
- 10. sound thermal
- 11 thermal kinetic
- 12. electrical sound light
- 1. Because it produces light and thermal energies.
 - Because the potential energy which is stored in the spring changes into kinetic energy.
- The electrical energy changes into mechanical energy.
 - The potential energy changes into kinetic energy.
 - The electrical energy changes into light and thermal energies.
- Chemical energy (all items are forms of kinetic energy, while chemical energy is a form of potential energy).
 - Light energy (all items are forms of energy, that can't be seen, while light energy is a form of energy that can be seen).
- 10 1.a 2.a 3.d

Exercises on Lesson 4

- 1. d 2. d
- 2 1.b 2.a 3.c
- 1. (√) 2. (√) 3. (√)
- 1. Gasoline.
 - 2. Chemical potential energy.
- The stored chemical energy of food changes into kinetic energy so human can carry out different activities.
 - The stored chemical energy in the battery changes into light and thermal energies.
- 6 1. Food. 2. Gas oven.
 - 3. Flashlight.
- 7 1. chemical 2. Electrical 3. Sound

Exercises on Lesson

- 1 1. b 2. d 3. b
- 2 1.d 2.c 3.a
- 3 1. (x) 2. (x) 3. (√) 4. (x)
- 1. Potential energy
 2. Kinetic energy.
- 5 1. potential kinetic 2. gravity

Model Exam on Concept (2.2)

- 1 (A) 1.d 2.c 3.d 4.b
 - (B) Because each of them produces light and thermal energies.
- 2 (A) 1. (*) 2. (√) 3. (K) 4. (√)
 - (B) 1. chemical
 - 2. Electrical 3. Sound
- 3 (A) 1. kinetic 2. thermal 3. potential 4. chemical
 - (B) Its potential energy changes into kinetic energy.
- (A) 1. Kinetic energy.
 - Electrical energy.
 - Potential energy.
 - 4. Chemical potential energy.
 - (B) Chemical energy. (all items are forms of lonetic energy, while chemical energy is a form of potential energy).

Concept (2.3)

- 1 1.c 2.c 3.d 4.b 5.a 6.c 7.b 8.d
- 1.e 2.c 3.d 4.a
- 3 1.(*) 2.(\struct) 3.(*) 4.(\struct) 5.(\struct)

- 4 1. Wrecking ball. 2. Seatbelt.
 - 3. Airbag.
- 4. Vents.
- 1. kinetic
 - 2. Wrecking ball.
 - 3. car
- 4. changes.
- 5. Airbags
- 6. thin nylon
- kinetic energy.
- 6 1. kinetic increases.
 - 2. seatbelts airbags.
 - 3 change.
- 4. airbag
- 5. energy
- 6. energy
- 7. seatbelt
- 7 1. Because the kinetic energy of the bat transfers to the ball.
 - 2. Because the seatbelts are used in cars to keep the driver's body and also the passengers from moving forward when the car stops suddenly.
 - 3. Because the airbags slow the speed of the driver moving forward and they absorb the energy of the car due to its collision.
- 8 1. The kinetic energy of the bat transfers to the ball.
 - 2. The energy of collision will push the driver forward strongly that causes many harms to him.
- 2. c 3. d

- 10 1. The car is damaged more than the train. Because the car is slower and lighter than the train and the car has less energy.
 - 2. Airbags inflate automatically.

- 2. d 3. c 7. c 8. c 9. b
- 2 1 c
- 3 1. (*) 2. (*) 3. (\sqrt{)} 4. (*) 6. (x) 7. (\sqrt) 8. (\sqrt) 5. (x) 9. (*) 10. (\(\sigma\)
- 4 1. Collision.
 - 2. Sound energy.
 - 3. Fuel,
- 4. Speed.
- 5 1. kinetic
- 2. kinetic
- potential.
- 4. decreases.
- 6 1 collision.
 - kinetic sound.
 - 3. kinetic
- 4. more
- 5. light sound
- 6. meters hours seconds.
- 7.20
- decrease.
- 7 1. Because a part of kinetic energy changes into sound energy.

- 2 Because if the car increases its speed, its kinetic energy increases that results in exerting a large force during an accident.
- 1. The kinetic energy of the car increases.
 - 2. The damage would be much more severe.
 - 3. The speed of the toy car will increase.
- 1. The rabbit has the most kinetic energy. Because the speed of rabbit is more than that of tortoise.
 - decrease.
- 10 1. c 2. b 3. a
- 11 Speed = Distance $=\frac{400}{8}$ = 50 m/sec.
- 12 Speed = Distance $=\frac{200}{2}$ = 100 km/hr.

- 3. a 6. b 7. c 8. c
- 2 1. a 2. d 3. b

- 3 1. (x) 2. (x) 3. (\sqrt{) 4. (x) 5. (y)
- 4 1. larger 2. kinetic 3. more 4. Kinetic
- 5 1. speed kinetic
 - 2. decrease
 - 3. more
 - 4. more mass kinetic
 - 5. kinetic
 - 6. less
 - 7. chemical kinetic
- 6 1. Because the truck has more mass than the car.
 - Because the car has a smaller engine than the bus.
 - 3. Because the truck has a bigger mass, than the small car.
- 1. Its kinetic energy will decrease.
 - 2. Its kinetic energy will increase.
 - 3. The damage would be much more severe.
 - 4. The kinetic energy of the truck is more than that of the small car.
- 9 1. d 2. b 3. c

- 11 1, b 2. d 3. c 4. d 5. d 6. c
- 2 1.b 2.d 3.a
- **3** 1. (✓) 2. (✓) 3. (✗) 4. (✗) 5. (✗)
- 1. decreases.
 - 2. height
 - 3. a large
- 5 1. increase decrease
 - 2. kinetic angle
 - E. Mileto bilgi
 - 3. decrease
 - 4. less
 - 5. less
- 6 1. Because the car with mass 3 tons has speed and kinetic energy more than that of the car with mass 1 ton.
 - Because the truck has mass more than that of the car, so the truck has speed and kinetic energy more than that of the car.
- The time that taken to reach the end of ramp will decrease.
 - The speed of the ball will increase.

- Ramp (A). Because the speed of the truck increases by increasing the angle of the ramp.
 - The truck is faster than the car. Because the mass of the truck is more than that of the car, so the speed of the truck is more than that of the car
 - The speed of truck will increase.
- 9 1. (√) 2. (x) 3. (√)

Exercises on Lesson 5

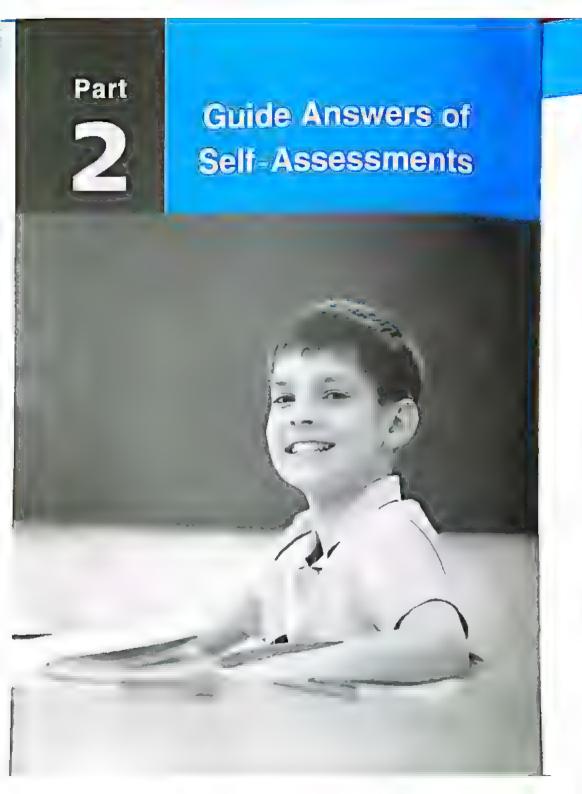
- 1 1.c 2.d 3.b 4.b 5.b 6 b 7.d
- 2 1.b 2.d 3.c
- 3 1. (*) 2. (**√**) 3. (**√**) 4. (*).
- 4 1. decreases
- 2. decreases
- 3. equal to
- 4. thermal
- 5 1. potential kinetic
 - 2. kinetic
 - kinetic sound
 - 4. kinetic thermal friction
 - 5. friction kinetic
 - 6. potential kinetic
 - 7. kinetic stop
- 1. Because some of the kinetic energy changes into sound energy during collision.

- Because the energy is conserved during the collision, so it cannot be destroyed.
- 7 1. It stores potential energy and doesn't have any kinetic energy.
 - The potential energy changes into kinetic energy.
 - Some of kinetic energy changes into thermal energy.
- (1) Rise up the first ball,
 - (2) Potential energy of the first ball decreases
 - (3) Kinetic energy is transferred from the first ball
 - (4) Kinetic energy of all balls decreases
- 9 1.c 2.b 3.a

Model Exam on Concept (2.3)

- (A) 1. d 2. c 3. a 4. c
 - (B) Because the kinetic energy of the bat transfers to the ball.
- 2 (A) 1. (√) 2. (×) 3. (√) 4. (√)
 - (B) The damage would be much more severe.

- (A) 1. kinetic energy.
 - 2. height 3. equal
 - 4. increases.
 - (B) (1) Rise up the first ball,
 - (2) Potential energy of the first ball
 - (3) Kinetic energy is transferred from the first ball
 - (4) Kinetic energy of all bails decreases
- (A) 1. Wrecking ball.
 - 2. Collision. 3. Vents.
 - 4. Sound energy.
 - (B) The car causes less damage.



2

UNIT ONE: Living Systems

Concepti(4:4)

Self-Assessment 1

- 1 (A) 1, b 2. b 3. a
 - (B) To hide from their predators or preys as the colorful scales make them hard to be seen among the rocks.
- 2 (A) 1. (¥) 2. (√) 3. (¥)
 - (B) They will be very hard for forest bears to hide and hunt their preys in the forest habitat.
- 3 1, Figure (b)
 - 2 The blood in the penguin's feet will be very cold so, the penguin cannot walk on ice for a long time and its toes may freeze.

Self-Assessment 2

- 🚺 (A) 1. structural behavioral
 - 2. behavioral structural
 - 3. tan white
 - (B) It cannot sneak up on its prey by camouflage.

- 2 (A) 1. short
 - 2. salt water and fresh water.
 - 3. reptiles
 - (B) 1 Behavioral adaptation.
 - 2. Camouflage.
 - 3. Structural adaptation.
- 1. arctic fox in summer.
 - sneak up on its prey in summer season.
 - 2. forest bear.
 - hide among the trees when it hunts.

Self-Assessment 3

- 1 (A) 1.a 2.c 3.b
 - (B) To prevent the plant from the loss of water.
- 2 (A) 1. acacia fennec fox
 - 2. snow rainforest
 - 3. arctic penguin
 - (B) Acacia tree and kapok tree.
- 3 1. Starred agama lizard and lennec fox.
 - Palm tree and barbary fig plant.
 - 3. 1. (**/**) 2. (*****)

- (A) 1. d 2. a 3. d
 - (B) Because it moistens food and begins to break it down.
- 2 (A) 1. (¥) 2. (√) 3. (¥)
 - (B) Nutrients will not be absorbed and will not be carried to all the body parts.
- 3. lungs. 4. stomach.
 - 5. respiratory digestive

Solf-Assessment 5

- 1 (A) 1. c 2. c 3. b
 - (B) Because humans breathe in air, and need clean water to drink, while fish need clean water to breathe.
- 2 (A) 1. (x) 2. (x) 3. (√)
 - (B) 1. Animal → Starred agama lizard
 - Plant → Barbary fig.
 - 2. Animal --- Panther chameleon
 - Plant → Kapok tree
 - 3. Animal → Penguin
 - · Plant -- Pine tree

- 4. Animal —> Bull shark
 Plant —> Mangrove tree
- 1. It has a very long trunk, so most animals except giraffe cannot reach its leaves to feed on.
 - 2. They have gllis to breathe under water.
 - It has white fur helps it blend in with the snow as it sneaks up on its prey.

Self-Assessment 6

- (A) 1. Starred agama lizard (all items are amphibians, while starred agama lizard is a reptile)
 - Palm tree (all items live in water environment, while palm tree lives in desert environment).
 - Acacia tree (all items live in rainforests, while acacia tree lives in savannah forest).
 - (B) Because their numbers were decreased in the last few years.
- (A) 1. Frog. 2. Skin. 3. Savannah forest.
 - (B) d. removing water from ponds and streams. Because wet environment is the natural habitat, where

amphibians can extract oxygen gas directly from water through skin.

- 1. Habitat (A) 2. Habitat (B)
 - 3. Habitat (A) 4. Habitat (A)
 - 5 Habitat (B) 6. Habitat (B)
 - 7. Habitat (A) 8. Habitat (A)
 - 9. Habitat (A) and habitat (B)
 - 10. Habitat (B)

Model Eram on Concept (1.1)

- (A) 1. cool 2. expands 3. mild
 - 4. blood vessels
 - (B) Because starred agama lizard belongs to reptiles, while golden frog belongs to amphibians.
- 2 (A) 1. (B) 2. (S) 3. (B) 4. (S)
 - (B) The digestive system could not do its function correctly.
- - (B) 1. Alveoli.
 - 2. Arctic fox.
- (A) 1. b 2. c 3. b 4. a
 - (B) 1. structural
 - 2. Esophagus

Concept (1:2)

Self-Assessment 7

- (A) 1. survive search for food.
 - 2. sight hearing
 - 3. eyes tongue
 - (B) Because they use ecolocation to locate their preys under water.
- 2 (A) 1. (×) 2. (√) 3. (√)
 - (B) 1. sight, smell and taste.
 - 2. Taste, tongue.
- 3 t.a 2.b 3.d 4.c

Self-Assessment (8)

- (A) 1.c 2.c 3.c
 - (B) To connect the sensory organs with the brain.
- 2 (A) 1. (V) 2. (V) 3. (X)
 - (8) ears ... brain
- 3 1. Bats 2. Snakes
 - 3. Owls 4. Dolphins

Self-Assessment 9

(A) 1 c 2.a 3.d

- (B) It cannot jump for long distances to run away from its enemies.
- (A) 1 fast. 2, hearing.
 - (B) Because they have a sharp sense of hearing that help it to survive under water.
- 3. (1) (2) 2. (2) (1) 3. (1) – (2)

- (A) 1, c 2, d 3, b
 - (B) Running when I see the wild animal coming towards me, because the brain can process what I see faster than what I hear.
- 2 (A) 1. Reaction time.
 - 2. Electrical impulses.
 - 3. Sensory receptors.
 - (B) The sensory receptors in the ears of the deer send a message to the brain telling it that there is a danger, then the brain processes this message and sends message to the legs of the deer to start running away to escape from the hunter
- 3 1. The rabbit saw a fox ..

- 2. The rabbit's nerves
- 3. The rabbit's brain processes
- 4. The rabbit's brain sent a signal

Self-Assessment 11

- 1 (A) 1. c 2. d 3. b
 - (B) Because owl has bowl-shaped face and feathers in its head.
- (A) 1. structural
 2. brain
 3. heat
 - (B) (1), (3), (4) and (6)
- 3 1. (✓) 2. (−) 3. (✓) 4. (✓) 5. (−) 6. (✓)

Type of adaptation	Sentence number
1 Structural adaptation :	(1) , (3) , (6)
Behavioral adaptation :	(4)

Model Eram on Concepts (1.1) & (1.2)

- 1 (A) 1. b 2. b 3. d 4. c
 - (B) It cannot cool its body.

- 2 (A) 1. (√) 2. (x) 3. (x) 4. (√)
 - (B) 1. Small intestine (All items belong to the nervous system, while small intestine belongs to the digestive system).
 - Diaphragm (All items belong to the digestive system, while diaphragm belongs to the respiratory system).
- 3 (A) 1. c-B 2. a-D 3. d-A 4. b-C
 - (B) Because it transfers messages between the brain and body parts.
- 4 (A) 1, reflex. 2, oxygen gas 3, penguin 4, reaction time.
 - (B) 1. gills 2. brain

Concept (1.3)

Self-Assessment (12)

- 1 (A) 1. (V) 2 (X) 3. (V)
 - (B) Because it has a mirror-like membrane on the back of its eye that bounces off the light.
- (A) 1. b 2 d 3. c (B) sight hearing stronger

3.c 2.d 3.c 4.d

Self-Assessment 13

(A) 1 c 2.d 3.b (B) He can see in the weakest

licitit levels.

- Z (A) 1. (V) 2. (V) 3. (V)
 - (B) Because noctumal animals have bigger eyes which are more sensitive to light than humans and their pupils usually open wider than humans.
- 3 1 Fishing cat. 2 Dolphin. 3. Tarsier 4. Owl. 5. Bat.

Self-Assessment 14

- (A) 1 a 2.c 3.c
 - (B) Because it reflects the light rays like a mirror.
- 2 (A) 1. (√) 2. (≭) 3. (×
 - (B) 1. Shake (all flems are animals that have super sense of sight, while shake as not).
 - Bat (all items are animals that have a tepatum functions in their eyes, while ball is not).

- 3 1. b
- 2, c
- 3, b

- 1 (A) 1. (✓) 2. (×) 3. (×)
 - (B) Because it considered as a transparent object that allows light to pass through.
- 2 (A) 1. d
- 2. c
- 3. a
- (B) 1. Mirror (all items are rough surfaces, while mirror is smooth surface).
 - Glass cup (all items are opaque objects, while glass cup is transparent object).
- 3 1. Yes.
- 2. b

Sell-Assessment 16

- (A) 1. reflects
- 2. small
- 3. one same
- (B) Light can't pass through the opaque object to the wall, so shadow of object is formed on the wall.
- 2 (A) 1. (×)
 - 2. (×)
- 3. (🗸)
- (B) To allow more light enters the cats eyes.
- 3 1. Mirror.
- 2. Glass.
- 3. Wood.
- 4. Plastic.

Self-Assessment 17

- 1 (A) 1. (✓) 2. (≭) 3. (✓)
 - (B) Fishing cats eyes don't glow and they don't have excellent night vision, so they can't hunt in the dark.
- (A) 1. Brain.
 - 2. Fishing cats.
 - 3. Rough surface.
 - (B) Because It has a strong sense of hearing by using echolocation property
- 3 1, c
- 2. a
- 4. b

Model Exam on Concepts (1.1), (1.2) & (1.3)

- (A) 1. Chameleon.
 - 2. Fishing cat.
 - 3. Owl. 4. Human.
 - (B) Because it contracts
 and moves down during
 inhalation to increase the
 size of chest, while it relaxes
 and moves up during
 exhalation to decrease the
 size of chest
- 2 (A) 1. d
- 2. e
- l. c 4.
- (B) It cannot adapt with the very cold weather in polar regions, so it may die.

- (A) 1, c 2 b
 - b :
 - (B) 1. (√) 2
- 2. (*)
- 3. d 3. (✓)
- (A) 1. Night vision goggles.
 - 2. Adaptation.
 - 3. Reaction time.
 - Opaque objects.
 - (B) 1. nervous
 - 2. bigger

Concept (1:4)

Self-Assessment 18

- 1 (A) 1. (×) 2. (×) 3. (✓)
 - (B) Because they use their wings to form different flash patterns to warn off predators or to attract a mate to reproduce.
- 2 (A) 1. behavioral
 - 2. humans.
 - sight.
 - (B) By producing a chemical reaction inside their bodies.
- 3 1.d 2.d 3.b 4.c

Self-Assessment 19

- (A) 1. c
- 2. b

3. d

(8) Because low-pitched sounds travel better through warm water.

- (A) 1. (★) 2. (✔) 3. (✔) (B) Dolphins and humpback
- Winter songs have high-pitched sounds, while summer songs have low-pitched sounds.
 - 2. a) No.
 - b) Oxygen gas.

whales.

Self-Assessment 20

- (A) 1. hearing sight.
 - hearing
 - 3. light
 - (B) Humpback whales start producing high-pitched sounds because this type of sounds travels better through cold water to communicate with each other.
- 2 (A) 1. dots
 - 2. mating
 - 3. hearing
 - (B) Light energy and sound energy.
- 3 1.



2. Answer by yourself.

- (A) 1. c
- 2. d
- 3. a
- (B) Because they use mirrors to attract the attention of rescue helicopters.
- (A) 1. Writing.
 - 2. Honeybee.
 - 3 Code
 - (B) Fireflies and honeybees.
- a. The child
 - b. The mother
 - c. The father

Self-Assessment 22

- (A) 1. high
 - 2. hearing sight
 - 3. sound
 - (B) To communicate over distances of many kilometers
- (A) 1. (★) 2. (★) 3. (✔)
 (B) Ants and acadia trees
- 3 1. (1) 2. (2) 3. (2) 4. (1)

Model Exam on Theme (1)

- 1 (A) 1. d 2. b 3. d 4. b
 - (B) The blood in the penguin's feet will be very cold, so the

penguin cannot walk on ice for a long time and its toes may freeze.

- 2 (A) 1. (×)
- 2. (1)
- 3, (🗸)
- 4. (×)
- (B) 1. Mangrove tree (All items live in desert habitat, while mangrove tree lives in salt water habitat).
 - Lungs (All items belong to the nervous system, while lungs belong to the resp ratory system).
- (A) 1. tarsiers
 - 2. flashing pattern
 - 3. carbon dioxide gas
 - 4. dolphins
 - (B) Because they enable fish to extract oxygen gas from water for respiration.
- 4 (A) 1. Snake,
 - 2. Light.
 - 3. Summer season.
 - 4. D aphragm.
 - (B) Yellow color of Jerboa allows it hides easily in sandy environment, so it can sneak up on its prey and hide easily from its pnemies.

Concept (2:1)

Self-Assessment 21

1 (A) 1. (**×**) 2. (√) 3. (√)

PART

- (B) To stop their movement.
- 2 (A) 1. b 2. d 3. a
 - (B) The shockwave truck, because it has three jet engines that make it faster than the normal truck.
- 3 1. Shockwave truck.
 - 2. It will move with a slower speed.

Sall-Assessment 24

- (A) 1.a 2.b 3.a
 - (B) This team will win the game, because the rope will move toward the team of greater pulling force.
- 2 (A) 1. parachutes.
 - 2. greater
 - 3. pushing
 - (B) Because by increasing the number of fire extinguishers, the speed of the cert will increase.
- 3 1.a 2 b 3.a

Self-Assessment 25

- (A) 1. pushing force of table pulling force of gravity.
 - balanced.
 - 3. friction
 - (B) Due to the effect of pulling force of gravity down toward the Earth.
- 2 (A) 1. (×) 2. (√) 3. (×)
 - (B) Friction force of air and friction force between the car tires and the road.
- (B) 1-2 (V) 3.(V)

Self-Assessment 26

- (A) 1.b 2.d 3.a
 - (B) Due to the friction force between the ball and the ground that acts in the opposite direction of ball movement.
- (A) 1. Pulling force.
 - 2. Force of gravity
 - 3. Jet engine
 - (B) The car travels a distance longer than the truck.
- 3 1 pushing 2 ground air
 - 3 oecreases 4 langer
 - 5 pushing

Self-Assessment 27

- (A) 1, a 2. a 3. b
 - (B) Because their is a friction force between the moving body and the ground that acts in the opposite direction of the body movement.
- 2 (A) 1. equal to 2. equal to 3. shorter
 - (8) Because car (8) is smaller than car (A), so it travels a distance longer than car (A).
- (A) 1. (3) and (4) 2. (1) and (2)
 - 3 Friction
 - (B) 1. (x) 2. (√) 3. (√)

Model Exam on Concept (2.1)

- 1 (A) 1. b 2. d 3 b 4 d
 - (B) The shockwave truck starts to stop gradually.
- 2 (A) 1. (X) 2. (\sqrt{)} 3. (\sqrt{)} 4. (X)
 - (B) Due to the help of powerful three jet engines
- 3 (A) 1. energy 2. longer 3. pulling – pulling 4. fixed
 - (B) Car (A), because it travels a longer distance than car (B)

- (A) 1. Pulling force.
 - 2. Pushing force.
 - 3. Force. 4. Friction.
 - (B) It will move faster.

Concept:(2.2)

Self-Assessment 28

- 1 (A) 1. c 2. d 3. b
 - (B) The stored potential energy in the train is changed into kinetic energy.
- 2 (A) 1. (★) 2. (★) 3. (✔)
 - (B) Because his stored potential energy changes into kinetic energy.
- 31.1-2
 - 2. (2) (3)
 - 3. kinetic increase

Self-Assessment 29

- (A) 1. d 2. c
 - (B) Because its height from the Earth's surface will increase.

3. d

- (A) 1. (★)
 (B) Its potential energy changes
- into kinetic energy.

Solf-Acaessment [30]

1 (A) 1. c 2 c 3

- (B) Because the battery stores chemical potential energy, while a ball at the top of hill stores gravitational potential energy.
- 2 (A) 1. (X) 2. (X) 3. (X)
 - (B) Its potential energy changes into kinetic energy.
- 3 1. a 2.c 3.a
 Self-Assessment 31
- 1 1. b 2.c 3.c
- (A) 1.(√) 2.(*) (B) 1.b 2.c 3.d 4.a
- 3 1. c 2.a 3.b

1 1.b 2.d 3.b

- Its potential energy changes into kinetic energy
 - 1c 2b 3c

Model Exam on Concepts (2.1) & (2.8)

- 1 (A) 1 a 2.c 3.b 4 c
 - (B) His potential energy changes into kinetic energy
- 2 (A) 1. (x) 2 (x) 3. (v) 4 (v)
 - (8) Because burning of tood produces kinetic energy to carry out different activities.

- 3 (A) 1. potential 2. work
 - 3 gravity. 4. long
 - (B) 1. Shockwave truck.2. It cannot stop easily
- (A) 1 Shockweve truck.
 - 2. Friction force.
 - 3. Kinetic energy:
 - 4. Sound energy.
 - (B) c

Concept (23)

Self-Assessment 33

- 1 (A) 1.d 2.c 3.d
 - (S) To allow the driver to get out of the car.
- 2 A) 1 (V) 2 (V) 3 (F)
 - (8) The aroags will infinite and fill with a gate.
- School _ Gar

Self-Assessment 34

- 11.Allb 2a 3.c
 - 19 Speed = Desirter
 - = 245 = 60 km/k
- 2 (A) 1 (E) 2 (E) 3 (V)
 - , 81 by landed energy will recrease.
- 31c 25 Ac 45

Self-Assessment 35

- 1 (A) 1. c 2. c
 - (B) Because the vehicle with the large mass has more kinetic energy than that of the vehicle with the small mass, so it causes more damage.
- 2 (A) 1. (★) 2. (✔) 3. (✔)
 (B) Its kinetic energy will increase.

Self-Assessment 36

2. a

3. c

(A) 1. d 2. a 3. d

3 1. b

- (B) Because the speed of the object that moves down a ramp increases by increasing the angle of the ramp.
- (A) 1. (★) 2. (✓) 3. (✓)

 (B) Its kinetic energy will increase
- 3 1.b 2.d 3.a 4.b

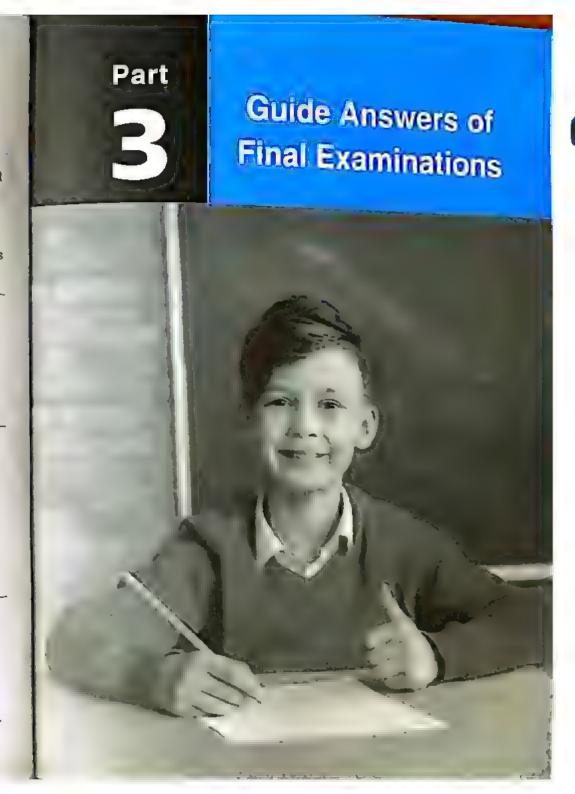
Sell-Assessment 37

- 1 (A) 1. c 2. d 3. c
 - (B) Because some of kinetic energy of balls changes into sound energy.
- **2** (A) 1. (**x**) 2. (**√**) 3. (**√**)
 - (B) Their kinetic energy will decrease gradually until they stop.

3 1. b 2. d

Model/Examion Thems (2)

- 1 (A) 1.c 2.b 3.d 4.c
 - (B) 1. Due to the help of three jet engines.
 - Because its stored energy changes into kinetic energy, that helps it moves downward
- 2. (A) 1. (★) 2. (★) 3. (✔) 4. (✔)
 - (B) The energy of collision will push the driver forward strongly that causes many harms to him.
- (A) 1. Pushing force. 2. Kinetic energy.
 - Speed. 4. Seatbelts.
 - (B) Chemical energy (all items are forms of kinetic energy except chemical energy which is a form of potential energy.
- (A) 1. kinetic.
 - 2. decreases.
 - 3. energy
 - 4. chemical
 - (B) The speed of the train $= \frac{\text{Distance}}{\text{Time}} = \frac{240}{3} = 80 \text{ km/hr}.$



El-Moasser Final Examination Models

Model Exam 1

- (A) 1. b
- 2. c
- 3. d

3. (<

- (B) To prevent the driver and passengers from moving forward when the car suddenly stops.

2. (1)

- 2 (A) 1, (¥) 4. (X)
 - (B) The kinetic energy will increase.
- 3 (A) 1, decreases. 2. nose increase
 - 4. kinetic sound
 - (B) Pulling force: 2-6 Pushing force: 1-3-4-5
- (A) 1. Trunk.
- 2. Nerves.
- Friction force.
- 4. hour or second
- (B) speed = Distance $=\frac{300}{30}$ = 10 m/sec.

Model Exam 2

- 1 (A) 1, parachules
 - 2. kinetic
 - 3. electrical sound
 - 4. light sound
 - (B) Due to the pushing force of his hand against the ball that stops it.

- 2 (A) 1. c 2. b 3. c 4. d
 - (B) Light is reflected in different directions.
- (A) 1, cars
 - 2 thermal energy.
 - 3. sharp
- 4. tires

(B)

Opaque objects	Transparent objects
• Wood.	Alr. Water.
Metal.	• Lenses.

- 4 (A) 1, Nurse ants. 2, Gravity.
 - Needle leaves.
 - 4 Nose.
 - (B) Speed = Distance Time $=\frac{160}{2}$ = 80 km/hr.

Model Exam 3

- (A) 1, c 2. d 3. b 4. b
 - (B) Because the mirror has more smooth surface than the painted surface.
- 2 (A) 1. (×) 2.(1) 4.(1)
 - (B) Speed = Distance $=\frac{240}{3}$ = 80 km/hr.

- (A) 1. Sense organs.
 - 2. Vents or Holes.
 - 3. Rough surface.
 - 4. Diaphragm.

(B)

Organisms live in deserts	Organisms live in forests
 Starred agama lizard. Fennec fox. Pa m tree. Barbary fig plant. 	- Panther chameleon Kapok tree.

 (A) 1. esophagus – stomach 2. trachea

(日)

Points of comparison	inhalation	Exhalation
1. Diaphragm movement:	Downward	Upward
2. Size of chest cavity:	Increases	Decreases
3. The air is rich in :	Oxygen gas	Carbon dioxide gas

Model Exam 4

- (A) 1. Camouflage.
 - 2. Nervous system.
 - 3. Electrical energy.
 - 4 Work.
 - (B) The Sun (or candle etc.).
- 2 (A) 1.c 2. a 3. d 4. d

- (B) The ecosystem still clean without pollution.
- (A) 1. unbalanced
 - 2. sound
 - 3. Kinetic energy
 - 4 nervous system.
 - (B) Speed = Distance $=\frac{200}{5}$ = 40 m/sec.
- 4 (A) 1. ears brain
 - 2. smell movement
 - 3, decrease.

(B)

-	Points of comparison	Polar bear	Forest bear
	1. Habitat :	Potar habitat,	Forest habitat.
	2. Fur color :	White.	Black or brown.

Model Exam

- - 4. d
 - (B) it cannot reach to underground water in dry season, and cannot survived.
- 3.(1) (A) 1. (√) 2. (×) 4. (1)
 - (B) 1. Balanced.
 - 2. Unbalanced.

3. b

- (A) 1 Fennec foxes.
 - 2. Gravity.
 - 3 Airbags.
 - 4 Mangorove tree
 - (B) To be away from animals that eat its leaves.
- 4 (A) 1. Changing
 - 2. pulling
 - 3 Airbags
 - 4. pulling force
 - (B) 1. nervous
 - 2.(2)-(3)-(1)

Model Exam 6

- (A) 1. b
- 2. d 3. b
- 4. a
- (B) Because camouflage helps some animals hide from their predators or preys in different environments.
- 2 (A) 1. (X) 2. (X) 3. (X) 4. (\sqrt{)}
 - (B) Animals have super sight sense: Tarsier Fishing cat.
 - Animals have super hearing sense · Bat ~ Dolphin.
- (A) 1. Small intestine.
 - 2. Countershading.
 - 3. Energy.
 - 4. Tongue.

- (B) Speed = $\frac{\text{Distance}}{\text{Time}}$ = $\frac{150}{5}$ = 30 m/sec.
- (A) 1. potential energy,
 - 2. potential energy
 - kinetic energy.
 - 4. kinetic energy
 - (B) 1. Figure (a)
 - 2. Figure (b)
 - 3. diaphragm increases
 - 4. carbon dioxide

Model Exam 7

- 1 (A) 1. b
 - 1. b 2. d 3. d 4. d
 - (B) Some of kinetic energy is changed into thermal energy.
- (A) 1. penguin polar bear
 - 2. electrical light sound.
 - 3, energy
 - 4 hearing bats dolphins
 - (B) 1, c -→ B
 - 2. a → D
 - 3. d —→ A
 - 4. b → C
- 3 (A) 1. (✓) 2. (★) 3. (✓) 4. (★)
 - (B) Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{250}{5}$ = 50 m/sec.
- 4 (A) 1. Respiration process.

- 2. Panther chameleon.
- 3. Fuel.
- 4. Chemical energy.
- (B) Because polluted air causes harm to the respiratory system.

Model E≥am

- (A) 1. (★) 2. (✔) 3. (✔) 4. (✔)
 - (B) Because speed = Distance
- (A) 1. b 2. b 3. c 4. b
 - (B) Speed = Distance Time = $\frac{220}{2}$ = 110 km/hr.
- (A) 1. increases.
 - 2. Water
 - 3. stronger
 - 5. different
 - (B) The nurse ants send smelly messages to scout ants that alert other ants where to find the food.
- (A) 1. The Moon (All items are sources of light, while the Moon reflects the light).
 - Fireflies (All items use echolocation property, while fireflies cannot use echolocation property)

- Bull shark (A) items five on land, while bull shark lives in water).
- Flashlight (All items produce sound energy, while flashlight produces light energy).
- (B) 1. parachute.
 - 2. shockwave truck.

Model Exam 9

- (A) 1. wings code
 - 2 (B) (A)
 - 3. lungs
 - aubags seatbeits.
 - (B) Due to the difference in the forces that act on them.
- 2 (A) 1. (¥) 2. (√) 3. (√) 4. (¥)
 - (B) Speed = $\frac{\text{Distance}}{\text{Time}}$ = $\frac{400}{20}$ = 20 m/sec.
- (A) 1. The soldier ants.
 - 2. Penguin.
 - 3. Light.
 - Nervous system.
 - (B) They cannot communicate with each other or locate the objects around them by the sense of hearing.

- (A) 1. d 2. d 3, c 4. c
 - (B)

\- /	
Types of communication	The used senses
1. Watching TV.	- Sight and hearing.
2. Flashing lights of fireflies.	- Sight.
Echolocation in dolphins.	- Hearing.
4. Using the cell	- Sight and hearing.
phone.	

Model Exam 10

- 1 (A) 1. c 2. a 3. d 4. c
 - (B) Because it transfers messages between the brain and body parts.

- (A) 1. energy
 - 2. bat dolphin
 - 3. kinetic
- 4. kinetc

(B) Speed =
$$\frac{\text{Distance}}{\text{Time}}$$

= $\frac{100}{2}$ = 50 km/hr.

- 3 (A) 1. e 2. d 3. a 4. b 5. c
 - (B) It will fall down on the ground due to the pulling force of gravity.
- 4 (A) 1. (\checkmark) 2. (\checkmark) 3. (x)
 4. (\checkmark)
 (B) 1. (1), (3) 2. (4)
 3. (2)

FinaliExamination of Some Governorates

Cairo Governorate

1 Nasr City Edu. Zone

- 1. (*) 2. (*) 3. (\(\sigma\) 4. (\(\sigma\)
- 2. echolocation 3. nervous 4. esophagus.
- 3 1.a 2.a 3.d 4.c
- (A) Because dolphin use echolocation as it has a strong sense of hearing.
 - (B) Snake

2 Heliopolis Edu. Zone

- 1.b 2.a 3.d 4.d 5.a
- 2 1. (✓) 2. (x) 3. (x) 4. (✓) 5. (x)
- (A) 1. Kinetic energy.
 - 2. Kilometer.
 - 3. Camouflage.
 - (B) 1. Dogs live in cold environment have thick fur, to keep their bodies warm.
 - 2. The Sun and a candle.

3 El-Sahel Edu. Zone

- 1 1.a 2.c 3.c 4 a 5.c
- 2 1.(x) 2.(√) 3.(x) 4.(√) 5.(x)
- (8) Speed = Distance
 - = 150 = 15 m/sec.

4 El-Zeitoum Edu. Zone

- 11.a 2.b 3.c 4.a
- 2 1.(x) 2.(x) 3.(√) 4.(√)
- (A) 1.c 2.a (B) 1 b 2.c 3.e 4.a
- 1. respiratory 2 rough
 3. structural
- 5 (A) using codes.
 - (B) Because dolphin use echolocation as it has a strong series of hearing.

Giza Governorate

5 North Giza Edu: Zone

- 1, carton
 - 2. from the sensory organs to the brain.
 - 3. consumes
- 4. chemical
- 7 1. a 2. d
- 3. c 4. b
- 3 1. (×) 2. (√) 3. (√)
- (A) Speed = $\frac{\text{Distance}}{\text{Time}}$ = $\frac{600}{6}$ = 100 km/hr.
 - (B) Figure (A), because the wooden spoon is a rough surface, so it reflects light in different directions.
- 5 1.b 2.c 3.e 4.a

6 6th of October Edu. Zone

- 1 1.a 2.c 3.c
 - 4. a 5. d
- 2 1. (*) 2. (\$\sqrt{}\$) 3. (*) 4. (\$\sqrt{}\$) 5. (\$\sqrt{}\$)
- (A) 1. Distance 2. gills
 - 3 mirror. 4. The Sun

(8) Dogs live in cold environment have thick fur, to keep their body warm.

Alexandria Governorate

7 El-Agamy Edu. Zone

- 1 1. c 2. a 3. c
- 2 1. (\(\sigma\) 2. (\(\sigma\) 3. (\(\sigma\) 4. (\(\sigma\)
- 3 1. b 2. c
- (A) 1. codes.
 - 2. carbon dioxide
 - (B) 1. Figure (a)
 - 2. Figure (b).

El-Qualyoubia Governorate

8 Obour Edu. Zone

- 1 1.d 2.a 3.c 4.a 5.d 6.a 7.a
- **2** 1. (√) 2. (**x**) 3. (√)
- 3 1.c 2.a
- 4 1. Pollution
- 2. Distance
- 5 Structural adaptation.

El-Sharkla Governorate

9 Al-Hessinia Edu. Zone

- 1.a 2.b 3.c
- **1**. (**x**) 2. (**√**) 3. (**√**)
- 1.c 2.a 3.b
- 1. reaction time.
 - 2. sound
- (A) 1. Because dolphin use echolocation as it has a strong sense of hearing.

energy.

- 2. Gravity pulling force.
- (B) To absorb a large amount of sunlight.

El-Gharbia Governorate

10 El-Santa Edu. Zone

- 11 1.a 2.b 3 b
- 2 1.c 2.a 3.b
- 3 1. (√) 2. (×) 3. (√)
- (A) Car (B) has the higher speed.
 - (8) Speed = $\frac{\text{Distance}}{\text{Time}}$ = $\frac{600}{E}$ = 100 km/hr.
- 5 1. Carton. 2 Eye.
 - 3 reaction time.

Kafr El-Sheikh Governorate

11 Al-Hamoul Edu. Zone

- 1.b 2.d 3.a 4 d 5.a
- 2.1.(x) 2.(\script) 3 (\script) 4.(\script) 5 (x)
- 3 1.b 2a
- 1. Wood 2. Ear 3. Mangrove

Al-Behira Governorate

12 Abou-Homous Edu. Zone

- 11 1.c 2 2 3.a 4.c
- 2 1, (x) 2 (x) 3.(x) 4.(\sqrt{})
- 1.5 km/hr 2. herves.
 - Chemical energy
 Gravity
- 4 1 b 2.c

Bani-Suaf Governorate

13 Beba Edu. Zone

- 110 20 32
- 2 1. (v) 2 (v) 3 (x)
 - 4.(4) 5.(4)

- 3 1.d 2.b 3.a 4.e 5.c
 - **Assiut Governorate**

14 Asslut Edu. Zone

- 11.a 2.b 3 d 4.a 5 a
- 2 (A) 1. (¥) 2. (¥) 3. (¥) 4. (√)
 - (B) Speed = $\frac{\text{Distance}}{\text{Time}}$ = $\frac{600}{6}$ = 100 km/hr.

(A) 1. d 2. a 3. b (B) potential – kinetic,

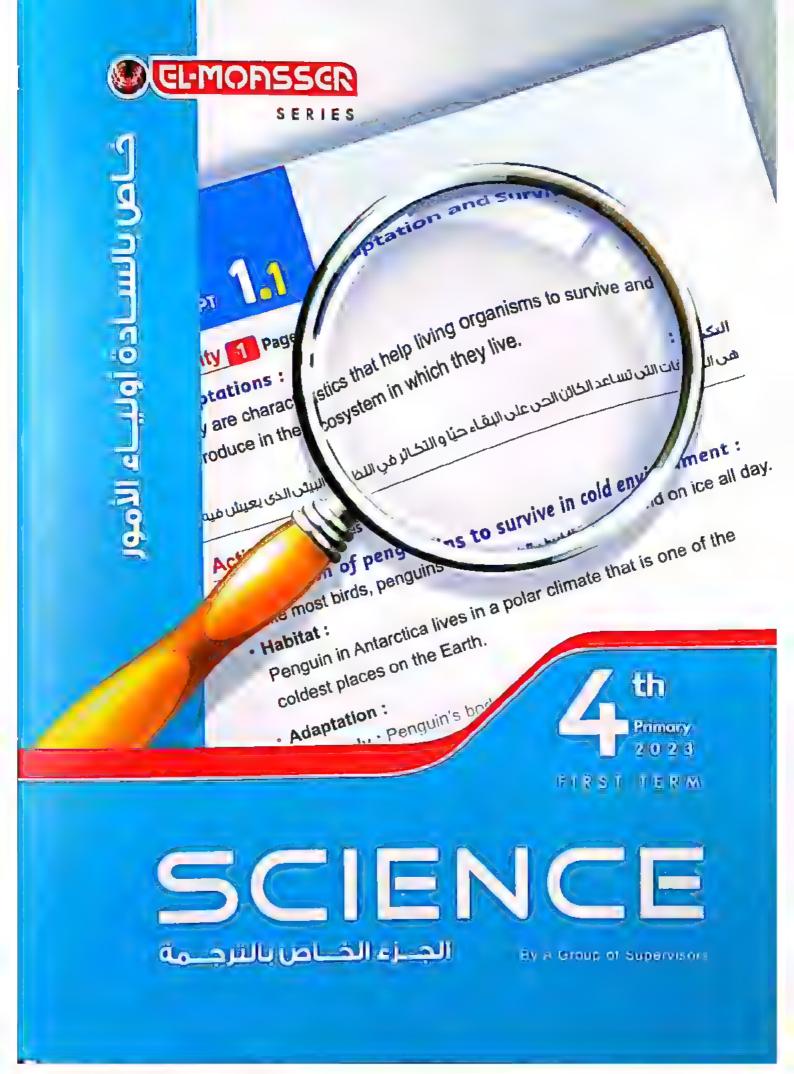
Sohag Governorate

15 Sohag Edu. Zone

- 1 1. carton 2. work
 3. ear 4. hearing sense
 5. pollution 6. Teeth and tongue
- 2 1. (x) 2. (\sqrt) 3. (x) 4 (x) 5. (\sqrt)
- 3 1 A small car 2. Gravity pulling force.



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## أعزاءنا السادة أولياء الأمور...

◄ حرضا منا على مساعدة حضراتكم في فهم مادة Science بطريقة مبسطة حتى يتستّى لكم مساعدة أبنائكم في فهم واستيعاب المادة العلمية، قمنا بإعداد هذا الجزء الخاص بترجمة الأجزاء التي تحناج إلى إيضاح باللغة العربية.

◄ ونحن إذ نقدم هذا الكنيب المترجم للساده أولياء الأمور، ننصح بعدم اعتماد الطفل عليه أثناء المذاكرة، وذلك لضرورة أن يتدرب الطفــل على فهم المادة باللغة الإنجليزية والتي هي لغة دراســـته كما أنها لغة الامتحان النهاتي.



## CONCEPT 1

#### **Adaptation and Survival**

#### Activity Page 17

#### Adaptations:

They are characteristics that help living organisms to survive and reproduce in the ecosystem in which they live.

التكيف:

هي الصفات التي تساعد الكائل الحي على الساء حيًّا والنكائر في النظام النيتي الذي يعيش فيه.

#### Activity Pages 18, 19

- Adaptation of penguins to survive in cold environment : Unlike most birds, penguins cannot fly but they can stand on see all day.
  - Habitat : Penguin in Antarctica lives in a polar climate that is one of the coldest places on the Earth.
  - Adaptation :
  - Its body : Penguin's body is covered with dense feathers and a thick layer of fat to keep its body warm.
  - Its feet: Penguin's feet have no feathers.
    - تكيف النظريق للعيش في السنة البارجة :

طائر التعريق تبسن مثل معظم اتطبق فهوالا بمكنه انظير ونكبه يستطيع الوقوف على الثلج حموال السوما

- " الحوطي: يعبني البطريق في منح فضي في الفارة القطنية الجنوبية وهي أحد أبرد المناطق التمار الأرتبي
  - " أليكيف:
  - وجيعه حسم البطري بغطي ريس تنف وطبقة بيميته من الدهون للجافظ على The state of the s
    - ألسامه : أضام استدرى لا وحد يها رش

## - How do the penguin's feet stay warm?

- Blood vessels bring cold blood up from the feet.
- Other blood vessels bring warm blood down to the feet from the feather-coated body.
- These vessels weave around each other. When they touch, the warm blood vessels heat up the cold blood vessels, so the heat transfers to the penguin's feet.

#### ـ كيف لأقدام البطريق أن تعقى دافتة ؟

- يُحمل الأوعية الدموية الدم البارد من أرجل البطريق لأعلى.
- تحمل أوعية دموية أخرى دمًا دافئًا لأسفل من جسم البطريق المغطى بالريش إلى أرجله.
- تلتف هذه الأوعية الدموية حول بعضها البعض، وعندما تتلامس فإن الأوعية الدموية التي بها دم
   دافيء نقوم بندفئة الأوعية الدموية التي تحمل دم نارد، وبالنالي تنتقل الحرارة إلى أرجل البطريق.

#### Activity Pages 20 & 21

#### O Polar bear :

- · Habitat : Arctic region (polar region).
- · Adaptation : It has white and thick fur :
- Its white fur helps it blend in with the snow as it sneaks up on its prey.
- Its thick fur helps it stay warm in its cold arctic region.

#### 0 الذب القطبي :

- " الموطن : القطب الشمالي (منطقة قطبيه).
  - التكيف:
  - لديه فراء أبيض كئيف :
- فراءه الأبيض بمكنه من التخفي بين الثلوح والانقصاص على فريسته.
  - فراءه الكثيف يساعده على البقاء دافئًا في القطب الشمالي البارد.

#### @ Brown bear and black bear:

- · Habitat : Forests.
- Adaptation: They have dark fur to help them hide among the trees when they hunt.

#### 🕡 الدبية البنية والسوداء :

- الموطن : العابات.
- التكيف: لها فراء ذاكن يساعدها على التحقي بين الأشجار للصيد.

#### © Caracal and fennec fox:

- · Habitat : Desert.
- Adaptation: They have sandy-colored fur (tan-colored fur) to help them blend in with desert landscapes.

#### 🕡 القط البرى وتعلب الفنك:

- الموطن : الصحراء
- التكيف: لديهم فراء دهبي يمكنهم من التخفي في الصحراء.

#### O Some desert lizards :

- · Habitat : Desert.
- Adaptation: They have colorful scales that make them hide among the colorful rocks in the desert.

#### 🗓 بعض سحالي الصحراء :

- الموطن: الصحراء
- التكيف: لديها حراشيف ملونة تمكنها من التخفي بين صحور الصحراء الملونة.

#### - Camouflage :

It is a type of adaptation that some animals use to hide from their predators or their preys by brending in with the surrounding environments.

#### ـ التخفي :

هي أحد صور التكيف لدى بعض الحيوانات والتي يستخدمها للنحفي من الحيوانات التي تريد اقتراسه أو التحفي من فرائسه من خلال الاندماج مع البيئه المحيطة.

#### - Notes:

- Predator is an animal that hunts and eats another animal.
- · Prey is an anima, that is nunted and eaten by another animal.

#### - ملاحظات :

- الحيوان المفترس هو الحيوان الذي يقوم بإصطياد وأكل حيوان آحر.
- الفريسة هي الحيوان الدي بنم اصطياده وأكله من فبل حيوان آخر.

#### Activity Pages 27 & 29

#### Structural adaptation :

It is a change in the body structure of a living organism to help it survive.

#### Behavioral adaptation :

It is a change in the behaviors or acts of a living organism to help it survive.

#### • ئكيف تركيبي ،

هو التغير في تركيب جسم الكائن الحي ليساعده على البقاء حبًا

#### ا تکېف سلوکي :

هو النعير في سلوكيات أو تصرفات الكائن الحي لتساعده على اليفاء حيّا

#### · Bull shark :

#### Habitat :

Fresh water and salt water.

#### · Structural adaptation :

- Its body is adapted to survive in fresh water,
   where no other sharks live in fresh water, so it has less competition to find food.
- It uses a camouflage strategy called "countershading", where it has a dark back and white belly to sneak up on prey.
- It has sharp teeth to cut its prey's flesh.

#### Behavioral adaptation :

- It eats different types of food as it lives in both fresh water and salt water.
- It hunts during the day and at night, so it can surprise its prey.

#### " قرش النور :

#### • الموطن :

الماء العذب والماء المالح.

#### • التكيف التركيبي:

- يتكيف جسمه للعيش في الماء العدب حيث لا يوجد فروش أحرى تعيش في الماء العذب وبالنالي بكون المنافسة أقل في الحصول على الطعام.
- يمكنه استخدام استراتيجية تحف نسمى «التناين اللونى» حيث إن لديه ظهر أسود وبطن أبيض هما يمكنه من الانقضاص على فرائسة.
  - لذية أسبان حادة تمكية من نمريق لحم قرالسة.

#### • النكبت السلوكي:

- يمكنه سؤول أنواع مختلفة من الطعام حيث أنه يعيش في الماء العدب والماء المالح.
  - يمكنه الاصطباد أثناء النهار وفي الليل وبالثالي فهو يفاجيء فرائسه

#### Activity 5 Page 31

# Adaptation of the panther chameleon to survive in its environment:

#### · Structural adaptation :

- Chameleon has brightly colored scales to help it make camouflage and hide between green leaves and colorful flowers.
- Chameleon eyes can face opposite directions, where each eye can move independently from the other, so one eye can search for food like insects, while the other eye looks out for danger in a different direction.
- Chameleon has V-shaped feet and a tail like a hand to hold tightly the branches of trees.

#### Behavioral adaptation :

When chameleon finds itself in danger, it doesn't have teeth or claws for defense, but it has one last trick to scare its enemies (attackers), where it appears as fierce as follows:

- 1. It puffs up its body with air.
- 2. It opens its mouth wide.
- 3. It changes the colors of its scales.

#### تكيف حرياء النمر للعيش في بيئتها :

#### ° التكيف التركيبي :

- لديها حراشيف راهية الألو ب لتمكنها من الثخفي بين أوراق الأشحار الخصر ء والأزهار الملوبة.
- لديها عبنان بمكنهما النظر في اتجاهين مختلفين بحيث كل عين تتحرك منفردة، لدلك يمكن
   لأحد العبنان أن ثبحث عن الطعام مثل الحشرات، والعين الأخرى تراقب الحطر في الاتجاه الأحر
- لديها أقدام على شكل حرف «V» وذيل طويل وبالتالي يمكنها أن تمسك بفروع الأشجار بفوة.

#### • التكيف السلوكي :

حرباء النمر ليس لديها أسنان أومحالب للدفاع عن نفسها، ولكن لديها حينة لإحافة أعدائها عند الشعور بالخطر وطهورها بشكل شرس من خلال :

١- تبعج جسمها بالهواء.

٢- تفتح فمها واسعًا.

٣- تعبر لون حراشيفها.

#### Activity 6 Pages 41 & 42

#### Behavioral adaptation:

#### Acacia tree can defend itself as follows:

- It produces a poison when an animal begins eating its leaves to make the leaves taste very bad to keep this animal away
- It sends a smelly message in the wind to warn other acacia trees nearby telling them to start making the same poison.

#### Behavioral adaptation:

- Kapok tree has delicious-smelling flowers to send messages through wind to attract bats towards it.
- Kapok tree has fluffy yellow seeds to be easily carried by wind across the forest.

#### التكيف السلوكي:

#### بمكن لشجرة السنط الدفاع عن نفسها كما يلي:

- عند افتراب حبوان ما لأكل أورافها، فأنها تعرز ماده سامة تجعل مناق الأوراق سينًا لإبعاد الحيوان.
  - ترسل رسالة تحديرية دات رائحة تحملها الرباح لأشجار السنط الأحرى الموجودة حولها للبدء في إنتاح نفس السم

#### التكيف السلوكي

ـ شجرة لكابوك له، أزهار دات رائحة طيبة وذلك لكي ترسل رسائل تحملها الرياح لتجذب الحفاقيش إليها.

ـ شجرة لكانوك لها بذور صفراء رفيقة وذلك لتحملها الرباح بسهوله عبر الغابه.

#### Activity 9 Pages 52, 53 & 54

#### · System:

It is a group of organs that work together to perform a specific job (function).

#### · Digestion process :

It is a process of breaking down food into smaller parts that the body cells absorb and use them to get energy and growth.

#### · Stomach:

- It is a muscular organ.
- It mixes food with the stomach acid and digestive juices (enzymes) found in it to change the food into a soupy liquid.
- Food stays in the stomach for few hours, then the muscles of the stomach move the food into a long, winding tube called small intestine.

#### • الجهار :

هو مجموعة من الأعضاء التي تعمل معًا لأداء وظيفه معينة.

#### ا عملية الهضم:

هى عملية تكسير الطعام لأجزاء صغيرة لتتمكن خلايا الحسم من امتصاصها واستخدامها للحصول على الطاقة والنمو.

#### المعدة:

- هي عضو عضل.
- تقوم بحلط الطعام بحمض المعدة والعصارات الهضمية [الأبريمات] الموجودة بها لتحول الطعام إلى سائل.
- يظل الطعام داخل المعدة لعدة ساعات، ثم تقوم عضلات المعدة بتحريك الطعام إلى أنبوب ملتف طويل يسمى بالأمعاء الدقيقة.

#### Activity 11 Pages 57, 58 & 59

#### · Respiration process :

It is a process of pulling air in (inhalation) and pushing air out (exhalation) of the body.

#### · Trachea:

- It is a tube that allows air to pass into the "two lungs" which fill up with air like two balloons.
- Inside the lungs, the trachea is branched into two tubes known as "two bronchi"

#### · Two bronchi:

- They allow the air to enter the two lungs.
- They are divided into smaller and smaller tubes that look like the branches of a tree known as "bronchioles".

#### · Two lungs:

- Inside the lungs, the bronchioles end with little air sacs, surrounded by blood vessels known as "alveoli".
- Inside the blood vessels, oxygen moves into the blood which carries oxygen around the body to help other organs and systems to work.

#### • Diaphragm :

It is a large muscle at the base of ribs which plays an important role in inhalation and exhaustion.

#### ، عملية التنفس :

هي عملية سحب الهواء (الشهبق) داخل الحسم ودفع الهواء خارجة (الرفير)

#### ، القصبة الهوائية :

- ـ هي أبيوية تسمح بمرور الهواء إلى الرئنس اللنبي تمتلئان بالهواء مثل البالون.
  - ـ يتفرع الغصبة الهوائية داحل الرئة إلى فرعين هما الشعبتان الهوائيتان.

#### • الشعبتان الهواتبتان :

- يسمحان للهواء بالدحول إلى الرئتين.
- تنقسم الشعمتان الهواتينان إلى أنابيب أصغر فأصعر تشبه أعصان الشجر بسمى بالشعسات الهوائية.

#### • الرئتان:

- تنهى الشعيبات الهوائية داحل الرئنان بأكباس هواتية صعيرة تسمى بالحويصلات الهوائية وهي تكون محاطة بالأوعية الدموية
- داخل الأوعية الدموية، ينتقل الأكسجين إلى الدم الذي يحمله إلى كل أخراء الحسم ليساعد الأعضاء والأجهزة على العمل.

#### • الحجاب الحاجز:

هو عضلة كبيرة تقع أسفل الصلوع وله دور مهم في عمليني الشهيق والراس

#### Activity 12 Page 78

#### How do fish breathe under water ?

- Water enters the mouth of the fish and passes across the gills.
- Blood vessels inside the gills carry oxygen gas to the rest of the body and release curbon dioxide gas

#### كيف يتنفس السمك تجت الماء؟

- بدحل الماء إلى قم السمكة وبمر عبر الضائبيم
- بغوم الأوعية السمونة في الحياشيم تحمل غاز الاكسجين إلى بافي أجراء الحسم وأيضًا بتخلص عن غارياني كسند الكربون.

#### Activity 13 Pages 73 & 74

#### Types of environmental changes

- Slow changes :

These changes lead to:

Organisms will be able to adapt over time to survive

Rapid changes:

These changes lead to :

- Moving some organisms from one habitat to another, in which they can live and survive
- Disappearance and death of some living organisms.
- Extinction of some living organisms.

#### ألوع لتشرب ليسه

* هيرات بطيته

وهمة المقيرات بادين أن

جعل المخبب الحية فحره عثى المكنف يصرور الوقب يسفاء حيية

Allow wheth "

وهده البشيرات وإذان إلى

والخواد الذائمات الحية من موطن ألى موطن حرجيب بمكنها العيس والبهاء جية

خبلة وموت هتين الداليات الجيه

طدانين يثيني للتأبيات ليجيبة

#### Human activities, such as:

- 1, Cutting down forests.
- 2. Farming and clearing lands.
- 3. Building communities instead of grasslands.
- 4. Introducing plants and animals into the environment that were never part of the ecosystem.
- Air pollution that is caused due to the exhausts from cars and some factories.
- 6. Water pollution that is caused due to bad habits, such as throwing waste materials to waterways and soil.

أنشطة الإنسان مثل:

- ١- فطع العابات.
- ٢- رراعة ونسوية لأرض.
- ٣- بناء المجتمعات بدلًا من الأراضي الزراعية.
- ٤- إدخال نباتات وحيوانات على البيئة لم نكن في يوم من الأبام حرءًا من البطام البيئي.
  - ه- تلوث الهو ۽ الذي پنتج عن عوادم السيارات والمصابع.
- 3- تلوث الماء الذي ينتج عن بعض العادات السيئة مثل إلقاء المخلفات في مجاري المباه والتربة.

#### Activity 15 Pages 83 & 84

· Careers and adaptation:

Through researches, scientists can learn how different organisms adapt to their environments and help endangered species survive.

- The role of scientists to protect many types of amphibians from extinction:
- Scientists (biologists) are working to save many types of amphibians from extinction by studying:
- How amphibians breathe in air and water.
- Factors cause air and water pollutions that affect the life of amphibians.
- What make these animals sick in their environments.

#### • الوظائف والتكبف:

تمكن اتعلماه من معرفة كنتبه تكبت الكائنات الحية في بشاتهم من خلال الأنجاب مما جعلهم فادرين على الإنتاء على الحيونات الجهدية بالانفراض على فيد الحياة

• يور العلماء في حماية العديدس البرمائيات من الانقراص:

يقوم علماء الأحياء بالحفاظ على العديد من البرمائيات من الانقراص ودلك من حلال دراسة :

- -كبعيه على البرماليات في الهود والماء
- الغوامل التي تسبب سوث الهوأء والماء والبدان وتران على حياه البرمائيات.
  - ما يسب أمرض لبث لحيونات في ينتهم

# CONCEPT 1.2

#### Senses at Work

#### Activity Page 100

- Sound produced by dolphin travels in the form of waves called sound waves.
- These waves travel through water and when they hit objects, they bounce back to the dolphin in the form of echo.
- Echo helps the dolphin determine the location of prey and other objects.
  - 🐧 الصوت الذي يصدره الدولفين يبتقل على صورة موجات تسمى موحات الصوت.
  - € ينتقل هذه الموجات في الماء وعيدما تصطدم بالأجسام فإنها ثرند مرة أحرى للدولفين على شكل صدى صوت.
    - 🕤 صدى الصوت يساعد الدولفين على تحديد مكان الفريسة والأجسام الأحرى.

#### Activity Pages 105 & 106

#### O Snakes:

Snakes have the ability to sense heat of their preys' bodies using a specialized body part in their faces.

#### @ Bats :

- · Bats rely on echolocation like dolphins to find their food.
- The sound bounced back to bats help them to find their preys and move around.

#### O Owis:

- · Owls have both extraordinary sight and hearing.
- Bowl-shaped faces and specialized head feathers pick up and amplify distant sounds then direct these sounds into the owls' ears.
- Owls' large eyes allow them to detect tiny and faraway movements of their preys that hide in the grass or under the snow.
- Owls have the ability to turn their heads in all directions to search for preys everywhere.

#### 🕒 الثعابين:

التعليس لديها القدرة على الإحساس بحرارة أحسام فرائسها من حلال جرء حاص في وجوهها.

#### 🥥 الخفافيش:

- تعتمد الحفاقيش على تحديد الموقع بالصدى في إيجاد طعامها مثلما تعفل الدلافين.
  - الضوت الذي يرئد تلحف فيش يساعدها في إبحاد فرالسها التي تتحرك جولها.

#### 🥝 البوم:

- بصلك النوم حاستي نصر وسمع فاتعنين
- وحوه آلبوم آثنی نشبه آلوعاه وکدنت الریش الحاض الموحود فی رؤوسها بساعدها علی
   نصحیم الأعنوات البعیده و توجیهها إلی آدان البوم
- العبوب الكبيرة سنوم سنته على كتيب في الحركات السبيطة لفراتينها البعيدة التي تحسئ
   في الحشائش أو بحث الجبيد
  - النوم لذبه القدرة على هـ رؤوسها في كل الاتحاهات للبحث عن فرائسها في كل مكان.

#### Activity 6 Pages 107 & 108

#### O The brain:

- The brain is connected to a big nerve that runs through the backbone called the spinal cord.
- The brain is connected directly to some nerves such as the nerves of the eyes and the heart.

#### Its function:

It is the main control center in the body.

#### 10 The spinal cord:

The spinal cord is branched into smaller and smaller nerves.

#### Its function:

It helps carry messages to and from the body and the brain.

#### O Nerves :

Nerves are distributed throughout the body and connect the sense organs and the body parts with the brain.

#### Their function:

They carry messages from the brain to the spinal cord and other parts of the body, as well as from other parts of the body to the spinal cord and the brain.

#### Notes:

- The nerves transmit information from the sensory organs to the brain in the form of electrical impulses.
- 2. The five sensory organs contain a special type of nerves known as sensory receptors.

#### Sensory receptors:

They are nerves found in different parts of the body that are responsible for receiving information from the environment.

#### 🔾 المخ :

- يتصل المخ بمجموعة من الأعصاب التي تمر عبر العمود الفقري وبطلق عليها الحبل الشوكي.
  - بتصل المح ببعض الأعصاب بشكل مباشر مثل الأعصاب الحاصة بالعينين والقلب.

#### وظيفته:

هو مركر التحكم في جسم الإنسان.

#### 🔾 الحيل الشوكي :

يتفرع الحبل الشوكي إلى أعصاب أصعر فأصغر.

#### وظيفته :

يفوم يحمل الرسائل من وإلى أجراء الجسم والمح أيضًا.

#### 🔂 الأعضاب:

نششر الأعصاب عبر الجسم كله وهي تصل الأعصاء الحسية وأجراء الجسم بالمح.

#### وظيفتها :

تقوم تحمل الرسائل من المح إلى الحيل الشوكي ويافي أجراء الجسم، كما أنها تحمل الرسائل من نافي أجراء الحسم إلى الحيل الشوكي والمح

#### ملاحظات:

ا. نفوم الأعصاب بنقل المعلومات من الأعتماء الحسية إلى المح في صورة نبصات كهربية. ٢ تحتوى الأعصاء الحسية الحمس على نوع معين من الأعصاب تعرف بالمستقبلات الحسية.

#### المستقبلات الحسية :

هي مجموعة من الأعصاب الموجودة في مختلف أجراء الحسم وهي المسئولة عن استقبال المعلومات من البيئة المحيطة

## CONCEPT 1.3

#### **Light and Sight**

#### Activity 8 Pages 115 & 116

- Jerboa has large and sensitive ears, so it can detect even a quiet snake. (Structural adaption).
- Jerboa's feet and toes have hair to help it grip the sand when it hops and jumps.
- It hops in zigzag patterns, so it can escape quickly from danger.
   (Behavioral adaptation).
- Jerboa has long hind legs that enable it to jump a long distance.
   (Structural adaptation)

#### Reaction time:

It is the time taken by the body of a living organism to react to different information from the environment (such as danger).

- البربوع بمثلك آذان كبيرة وحساسة والتي تمكنه من الكشف عن الحركات البطيئة للتعبان
   أنكيف تركيبي].
  - يوجد على أقدام وأصابع اليربوع شعر بمكنه من الإمساك بالرمال عبد الففر
  - * يقفز البربوع في مسارات متعرجة ليتمكن من الهروب من الحطر (تكيف وطبقي)
  - يمثلك البريوع أرجل خلفية طويلة تمكنه من القفر لمسافات طويلة (تكبف بركيس).

#### زمن الاستجابة :

هو الرمن الذي يستغرقه جسم لكانن الحن في الاستجابة للمعلومات المختلفة من البيئة المحيطة [مثل الخطر]

#### Activity 2 Page 140

#### The fishing cat:

- It is a wild cat that hunts for food at night.
- The fishing cats eyes seem to glow in the dark because :
- . It has a mirror-like membrane on the back of its eyes.
- When the light enters the fishing call's eyes, it bounces off this membrane, allowing the eyes to collect more light.

#### القط السمَّاك :

- هو قط يرى يقوم بالصيد أثناء اللبل للحصول على العداء.
  - غيق القط السقاك للوجح في لطيم للسب
  - لديها عشاء في مؤجرة أعبيها يعمل كمرأة
- عند تحول الصوء إلى تُعنى نقط السفائة فإنه يرتد مرة آخري [ينعكس] عند سفوطه على هذا
   العشاء مما يسمح نفس الفط أن تجمع المريد من الصوء

#### Activity Pages 141 & 142

#### A source of light:

It is something that gives off (emits) its own light.

#### Note:

There are other objects that don't emit their own light, but they reflect the light falling on them, so they are not considered as sources of light such as the Moon and a mirror.

#### · How we see :

When the source of light emits light rays that fall on objects, the light rays bounce off these objects to our eyes to see them.

#### Unit 1 | Concept 3

#### · Light:

It is a visible form of energy that travels in the form of waves.

#### و مصدر الضوء :

هو أي شيء ينبعث منه (يشع) ضوءه الخاص

#### ملحوطة:

هناك بعض الأجسام التي لا تشع ضوئها الحاص ولكنها تعكس الضوء الساقط عليها، وبالنالي فهي لا تعد مصادر للضوء مثل القمر والمرآة.

#### • كىف نرى :

عندما يصدر مصدر ضوئي أشعه ضوئية وتسقط على الأجسام، فإن هذه الأشعة الصوئية ترتد [تنعكس] من الأجسام إلى أعيننا فترى تلك الأجسام

هو صورة مرئية من الطافة والذي ينتقل على هيئة موجات.

#### Activity Pages 147 & 148

#### Note:

Noctumal animals can see in the weakest light levels but in complete darkness, they depend on other senses such as hearing, smell and touch that help them move in the dark and avoid predators.

#### O Eyes :

- Tars er has huge eyes like owl, to gather and reflect any light available to give them a picture of its surroundings.
- Tarsier can't move its big eyes in their sockets like owl.

#### @ Head :

Tarsier can turn its head 180 degrees like owl, to focus on distant or near objects at night since tarsier cannot move its big eyes in their sockets.

الحيوانات الليلية يمكنها أن ترى في مستويات الضوء الضعيفة ولكن في الطلام التام تعتمد على حواس أخرى مثل السمع، والشم، واللمس وجميعها تمكن الحيوانات الليلية من الحركة في الظلام وتجنب الحيوانات المفترسة.

#### 🛈 الأعين:

- يمتلك حيوان التارسير عيون كبيرة مثل البومة، وذلك لتجميع أي ضوء حولها ثم تعكسه لتوفير صورة واضحة عن بيئتها المحيطة.
  - مثل اليومة، لا يمكن لحيوان التارسير أن يحرك عيونه الكبيرة داخل تجويف العين.

#### 🚯 الرأس :

بمكن لحيوان التارسير أن يدير رأسه بزاوية ١٨ درجة مثل اليومة، حتى يتمكن من التركيز على الأجسام الفريبة والبعيدة في الليل حيث أن النارسير لا يمكنه تحريك عيونه الكبيرة داخل تجويف العين.

#### Activity Page 152

#### How tapetum lucidum works:

- When light enters the eyes of such animals and falls on the tapetum lucidum layer, it bounces off it like a mirror.
- The light that the eyes do not detect at first passes through to the tapetum lucidum and gets bounced back for second time that makes the eyes of such animals get more amount of light at nighttime.

#### كيف بعمل البساط الشفاف :

- عندما يدحل الضوء إلى أعين تلك الحبوانات ويسقط على غشاء البساط الشفاف فإن الضوء يرتدمتل مايحنت للصوءمع المرآق
- الصوء الذي لم تستطيع العين تحديده في أول الأمر يسقط على عشاء البساط الشفاف ثم يرتد منه مرة ثانية مما يجعل عيون تلك الحيوانات تحصل على كمية أكبر من الضوء أثناء الليل.

#### Activity Pages 158 & 159

#### · Opaque objects :

- They are objects that don't allow light to pass through.
- Things cann't be seen through them.

#### · Transparent objects:

- They are objects that allow light to pass through.
- Things can be seen through them.

#### · Smooth Surface:

If the surface is smooth (such as a mirror), the light rays will reflect in one direction with the same angle at which they strike (hit) the object originally.

#### · Rough Surface :

If the surface is rough (such as a painted surface), the light rays will scatter or diffuse in different directions.

#### الأجسام المعتمة :

- هي الأجسام التي لا تسمح بمرور الضوء من خلالها.
  - لا يمكن رؤية الأجسام من حلالها.

#### الأجسام الشفافة :

- هي الأحسام التي تسمح بمرور الصوء من خلالها.
  - يمكن رؤية الأجسام من خلالها.

#### السطح الناعم:

إذا كان السطح ناعمًا (مثل المرآة) فإن أشعة الضوء تبعكس في اتجاه واحد بنفس الراوية. الأصلية التي سفطت بها أشعة الضوء على الجسم.

#### • السطح الخشن :

إذا كان السطح حيثيًا (مثل سطح مطلى بالدهان) فإن أشعه الصوء المتعكسة بيشيت وشعئر في اتحاهات مختلفة

## Communication and Information Transfer

#### Activity Page 174

#### How do fireflies use their senses to communicate?

- 1. Fireflies use their wings to form different flash patterns to:
  - Warn off other fireflies from predators.
  - Attract a mate to reproduce.
- They flash at regular periods of time, but if there is another group of fireflies flashing nearby, they will change their own flash pattern to match the flash pattern of the other group to communicate.

#### Note:

Humans use lights to communicate with each other to transfer information such as using traffic lights.

#### كيف تستحدم الخنافس المصيئة حواسها في التواصل؟

ا- تستحدم الحيافين المصينة أجيجتها إلاصلاق ومصات صوء في بمط مهين، وذلك:

- لتحدير بافي الحبائس العصبيّة بال وجود حبوثات مصرسة.
  - لحنب الحسن الأحرض أجل التكثر
- ومص الحنافس المصنة على فتراب مبنظمة، ونكن إذا كانت هباك مجموعة حيافس عصينة أخرى ومص باشرت ضها، قريها سوف غير بقط الإصاءة الذي تومض به ونقلد بقط المحمومة الأخرى السواصل معها

#### ملحوظة :

التشريستخدمون الضوء شواصل وهل المعلومات فيما ينهم مثل استحدام أشارات المرور

#### Activity 5 Page 179

#### · In winter :

- It is the mating season.
- Their songs have high-pitched sounds which travel better through cold water (High-pitched sounds such as the sharp voice of a woman).

#### · In summer :

- It is the feeding season.
- Their songs have low-pitched sounds which travel better through warm water. (Low-pitched sounds such as the rough voice of a man).

#### • في فصل الشتاء :

- هو موسم التراوج
- تكون أعانى الحيتان ذات درجة عالية [حادة] وهى التى تنتقل بصورة أفضل في الماء البارد [أصوات ذات درجة عالية مثل الصوت الحاد للمرأة].

#### • في فصل الصيف :

- هو موسم التعدية.
- تكون أغاني الحيتان ذات درجة منحفضة (غليطه) وهي التي تنتقل بصورة أفصل في الماء الدافيء [أصوات ذات درجة منخفصة مثل الصوت الغليظ للرجل]

#### Activity 6 Page 181

When sense organs receive this information and send messages to the brain, the brain decodes and interprets the meaning.

عندما تستقبل الأعضاء الحسية المعلومات وتقوم بإرسال رسائل إلى المح، فإن المح يقوم نفك تلك الشفرات ويفسر معناها.

#### Activity 7 Page 186

We can send encoding message to communicate with each other through different ways such as :

- 1. Using light energy that depends on the sense of sight.
- 2. Using sound energy that depends on the sense of hearing.

بمكن أن يقوم بإرسال رسائل مشعرة للتواصل فيما بيننا بعدة طرق محتلفة مثل :

ا- استخدام الطاقة الصوئية التي تعتمد على حاسة التصر.

٢- استخدام الطاقة الصوتية التي تعتمد على حاسة السمع.

#### Activity 8 Page 189

- In bees hive, they do special dances that represent a code to communicate with each other.
- The scout bee (dancing bee) moves in a figure-eight pattern, while vibrating its wings.
- The movements of this dance tell the other bees the correct direction and distance to food and water resources.
- O The other bees read the code of the dancing bee and then fly off to the specific location.
  - عن حلية شحل يقوم البحل بعمل رفضات حاصة تمثل شفرة معينة للتواصل فيما بينهم.
    - اتحرك الحلة الكتافة (نحلة ترافضة) في بمط على شكل رقم (8) مع اهترار صاحبها
- ◘ هذه الحركات الرقصة تصربافي البحل عن الطرق والمسافة الصحيحة لمصادر الطعام والماء
  - يعوم بافي البجل بقراءه شعرة البحلة الرافصة، ثم تظير للمكان المحدد.

## Starting and Stopping

## CONCEPT _____

#### Activity Page 210

#### How does this truck stop?

To stop this truck, engineers turned to the idea that is used in the rocket designs, where they installed three parachutes that the driver opens to help slow down the truck quickly.

#### كيف يمكن إيفاق تلك الشاحية ؟

لايتاق تلك الشاحية رهب الطعاء إلى فكره بضي في بصميم الصاروح، حيث فاموا سركيب ثلاث مطعت ولتي هوم السائق شجها غمساطة في إبطاء الشاحية يسرعة

#### Activity Page 213

#### Cart activity:

- Some engineers fix fire extinguishers onto a cart.
- When they release air from the fire extinguishers, the air moves backward that makes the cart begins to move forward.
- By increasing the number of fire extinguishers, the speed of the cart increases and the distance that it moves increases too and vice versa.

#### لشاط العربة :

- يعض المهينسون فجود بسيث بعض طفايات الخربق على غربة ضعيره
- مندجروح الهود من فضايت الحربي لإنه ينحرك ليحنف مما يحفق الغربة الصغيرة للحرال للأمام
- كَيْمَا زُدْ عَبَدَ طَعَانِبَ لَحَرِيقِ أَرْدَفِ سَرِعِهِ أَهْرِيةً الصَّفِيعِ وَأَبْضًا بَرِدَاد الصَّفَاقة السَّ يقطعها والعكس صحيح

#### Activity 10 Page 191

#### Ants:

- · Ants live in colonies that contain thousands of individuals.
- · Groups of ants within a colony have different roles, where they have developed systems that help them divide their work among themselves, so there are nurse ants, scout ants and soldier ants.

#### النمل:

- بعيش النمل في مستعمرات تتكون من آلاف الأفراد.
- تؤدي مجموعات النمل داخل المستعمرة أدوارًا مختلفة، حيث أبهم بقومون بإنشاء أنظمة تساعدهم على تقسيم العمل فيما يبيهم، لذلك يوجد عاملات النمل، والنمل الكشاف، وجنود النمل

#### Activity Page 197

#### Note:

Humans cannot hear the high-pitched sounds produced either from bats or the special cane of blind people.

#### ملحوظة :

لا يستطيع البشر سماع الأصوات ذات الدرجات العالية [الحادة] مثل التي تصدر ص الجفافيش أو العكار الحاص بالأشخاص المكفوفين

# CS CamScanner

#### Activity 4 Page 214

## The relation between motion with balanced and unbalanced forces:

- If there are balanced forces act on an object, so this object will not move
- If there are unbalanced forces act on an object, so this object will move.

العلاقة بين الحركة وكل من القوى المنزنة والغير منزنة :

- إذا أثرت قوى متزية على جسم ما، فإن هذا الجسم لن يتحرك.
- إذا أثرت قوى غير متزنة على جسم ما، فإن هذا الجسم سيتحرك.

#### Activity 5 Pages 216 & 217

· Motion :

It is any change in the position of an object relative to a fixed point.

Gravity:

It is the force that pulls objects down toward the Earth.

- Any object is in motion if the position of the object changes, even if this change cannot be seen.
- The change in position of an object is compared to something else that is not usually moving (fixed point).

• الحركة ؛

هي أي تغير في موضع الجسم بالنسبة إلى نقطة ثابتة.

الجاذبية :

هي القوة التي تسجب الأجسام لأسفل في اتجاه الأرض.

 بكون الجسم في حالة حركة إذا تغير موضع هذا الجسم حتى وإن كان هذا التغير في الموضع غير مراد .

التغير في موضع الجسم يقارن بشيء آخر ثابت عادة (نقطة ثابتة).

#### Activity 6 Page 222

#### Force:

It is a push or pull that is applied to an object causes it to change its position.

القوة:

هي الدفع أو السحب الذي يطبق على (يؤثر علىاً جسم مسببًا تغيير موضعه.

#### Activity 8 Page 224

- A moving object only stops when a force of the same amount is applied to it in the opposite direction of its motion.
- Sometimes it is easy to observe where the force that stops an object comes from, such as:

A car crashes into a wall, it will stop because the wall applied a force to the car with the same amount of the force that pushes the car towards the wall.

 Sometimes it is hard to observe where the force that stops an object comes from, such as :

A car runs out of fuel on a flat road, its speed decreases gradually until it stops, because there is a friction force comes from:

- 1. Friction (rub) between the car tires and the road.
- 2. Friction between the air that flows over the car against its surface.
- · Friction :

It is a force that is exerted when objects rub against each other.

#### Notes:

- 1. Friction force always slows down or stops motion of moving objects.
- The direction of friction force is always opposite to the direction of motion of a moving object.
  - يتوقف الجسم عن الحركة إذا أثرت عليه قوة لنفس المقدار في عكس اتجاه حركته.
- في بعض الأحيان يسهل ملاحظة القوة التي تسبب بوقف حركه الجسم، مثل:
   إذا اصطدمت سيارة بحائط فإنها تتوقف بسبب أن الحائط يؤثر على السيارة بنفس مقدار الفوة التي تدفع السيارة في اتجاه الحائط.
- في بعض الأحيان يضعب ملاحظة القوة التي نسبب نوقف حركة الجسم، مثل:
   إذا ثفد الوقود من سيارة تسير على طريق مستو، فإن سرعتها ثقل تدريجيًّا حتى تتوقف، ودلك بسبب وجود قوة احتكاك نتجت من:
  - ا. احتكاك إطارات السيارة بالطريق.
  - ٢. احتكاك الهواء حارج السيارة باتجاه مضاد لسطحها.
    - الاحتكاك :

هو القوة التي تنشأ عندما تحتك الأجسام ببعضها البعص

#### ملاحظات:

- ا. فوة الاحتكاك دائمًا تبطأ أو تسبب توقف الأجسام المتحركة.
- ٦. دنمًا يكون انجاه قوة الاحتكاك عكس أتجاه حركة الجسم المتحرك.

#### Activity 10 Page 230

#### Note:

If the same force acts on a toy car and a toy truck:

- The car (the small object) will travel a farther distance.
- · The truck (the bigger object) will travel a shorter distance.

#### ملحوظة

إذا أثرت قوة بنفس المقدار على سيارة لعبة وشاحنة لعبة، فإن :

- السيارة [الحسم الصعير] تتحرك لمسافة أبعد [أطول].
  - الشاحنه (الجسم الأكبر) تتحرك لمسافة أقصر.

#### Activity 11 Page 233

- · Force transfers energy from one object to another.
- The work done is equal to the amount of energy transferred by a force that is used to move an object.

#### Note:

Force and energy are different, but they are related to one another, where force is the effect that changes energy and turns it into work.

- القوة تبقل الطاقة من جسم إلى آخر.
- الشغل المبذول بساوى كمية الطاقة المنتقله بواسطة العوة التي سببت حركه الجسم.

#### ملحوطة :

القوة والطاقة محتلمان، ولكنهما مرتبطان ببعضهما البعض، حيث إن الفوة هي المؤثر الذي يعير الطاقة ويحولها إلى شعل.

#### **Energy and Motion**

#### Activity Page 244

- The roller coaster moves up rapidly, then its speed decreases
  gradually until it reaches the highest point, then it pauses briefly at
  the top of the hill (ramp), then the speed of the train will increase as it
  moves down the hill.
- As the roller coaster moves up the hill, there are electric motors that are used to carry the train cars up to the top of hill.
- At the top of the hill, the train stores some energy (potential energy) during its rising.
- 3. As the roller coaster moves down the hill, the energy stored in the train (potential energy) changes into a more active form of energy (kinetic energy) that helps it move downward, so the train doesn't need electricity.

پتحرك قطار الملاهى السريع لأعلى بسرعه، ثم نفل سرعته تدريجيًا حتى بصل لأعلى نفطة، ثم
 پتوقف لفترة وجيزة جدًّا عند قمة المتحدر، ثم تبدأ سرعة الفطار في الترايد وهو يهبط المتحدر.
 ا. عند صعود قطار الملاهى السريع لأعلى المتحدر، تقوم المحركات الكهربية به بحمل أو تحريك
 عربات القطار لقمة المتحدر.

٦. عبد قمة المتحدر، يكون القطار قد قام يتحربن بعض من الطاقة (طاقة وضع) أثناء ضعوده.
 ٣ عندما يقوم القطار بالهنوط لأسفل المتحدر، بتحول الطاقة المحربة داخلة (طاقة الوضع) إلى

طاقه أكثر نشاطًا (طافة حركة) والتي تساعده في الهنوط وبالتالي فلا يجتاح القطار إلى كهرباء

Activity 4 Page 250

#### Note:

Any stopped object on the Earth's surface as in figure (1) has no energy, white any object at a height from the Earth's surface as in figure (2) has a special type of energy known as potential energy.

#### بلحوطة .

أى حسم منوقف على سطح الأرض مثل شكل [۱] لبس لدبه طافة، سِما أى حسم موضوع على ارتفاع ما من سطح الأرض مثل شكل [۲] لدبه نوع خاص من الطافة بسمى طاقة الوضع.

#### Activity 5 Pages 251 & 252

- Energy: It is the ability to do work or cause change.
- · Work: It is a force that causes an object to move a distance.
- Energy can be stored and changed from one form into another.
- We can see and measure what energy can do.

Example: When you push a wooden box and this box moves, this means that the energy transfers from you to the box and also can be measured through the distance that the box moves.

- الطاقة : هي الشدرة على عدل شعل أو إحداث تعبير
- الشغل . هو القوة سي سنت حركة الحسم لمسافة معينة.
  - 🕒 انطاقة بعكن آن نحن أو ينحول من صورة إلى أخرى.
    - 🔾 لمكينا أن بري ولفيس ما لفعله الطاقة

مثال : إذا قطب سفح فسنوى حسني وتحرك هذا الصيدوق، فهذا يعني أن هباك طاقه قد البغلت عبث إلى الصيدوق وكتبك بعكن قباس هذه الصافة من حلال المسافة التي تحركها الصيدوق

#### Activity 6 Pages 253 & 254

· Potential energy :

It is the amount of energy that is stored in an object due to its position.

· Kinetic energy :

It is the energy of an object due to its motion.

#### Notes:

- 1. When an object has potential energy, so this object is ready to do work or to be active.
- 2. As the height of an object from the Earth's surface increases. potential energy stored inside this object increases.

طاقة الوضع:

هر كمية الطاقة المحزنة في جسم بسبب موضعه.

• طاقة الحركة :

ه . طاقة الحسم سبب حركته.

#### ملاحظات:

ا- إذا كان هناك جسم لديه طاقة وضع، فهذا بعني أن هذا الجسم جاهز لبذل شعَل أو جاهز ليكون تشظا.

٢- كلما زاد ارتفاع الجسم عن سطح الأرض، فإن طاقة الوضع المخزنة داخله تزداد.

#### Activity Pages 259 & 260

#### Notes:

- 1. The chemical energy in the battery is not used until this battery is connected to a device.
- 2. When a spring is compressed, it stores potential energy inside it.

#### ملاحظات:

١- الطاقة الكيميائية في البطارية لا يتم استخدامها إلا عند توصيل هذه البطارية بجهاز ما. ٢- عند ضغط زنبرك، فإنه يقوم بتحزين طاقة وضع بداخله.

#### Activity Pages 262 & 263

- · Energy is continuously changing and transforming from one form into another form.
- Energy is transferred from one place to another (such as when you kick a ball, energy moves from your leg to the ball).
- · Energy can be stored in many different forms.
- · New energy cannot be created and also existing energy cannot be destroyed.

#### Note:

The food you eat also stores chemical energy, where your digestive system breaks down the food you eat and changes it into energy stored in your body.

- الطافة دائمة النعير والانتقال من صورة إلى أخرى.
- الطاقة تنتقل من مكان إلى أحر (مثلما بحدث عندما تركل كرة، فإن الطاقة تتحرك أو تنتقل من فتمك إلى الكرة}
  - بمكن تحرين الطافة في عدة صور محتلفة.
  - لا يمكن استحداث طافة جديدة أو إقداء طافة موجودة بالفعل.

الطعام الذي تأكله أيضًا يحرن طافة كيميائية، حيث يقوم جهارك الهضمي بتكسير الطعام الذي أكلته وبحوله إلى طاقة تحرن في حسمك



#### **Energy and Collisions**

#### Activity Page 281

#### A wrecking ball:

- · It is a very heavy steel ball that swings on a cable.
- It is used to collide with walls of a building to help construction workers knock down walls or parts of buildings.

#### كرة الهدم :

- هي كرة ثقيلة جدًا من الفولاذ تتأرجح على كبل.
- تستخدم في الاصطدام بجدران المباني لتساعد عمال البناء في تحظيم الجدران أو أجزاء من المباني.

#### Activity Page 283

#### O Seatbelts:

They are used in cars to keep the driver and also the passengers from moving forward when the car stops suddenly, so seatbelts have saved thousands of lives.

#### @ Airbags :

#### Their structure:

Airbags are made up of thin nylon material folded into the steering wheel, seats, dashboard or doors.

#### Their importance:

- Airbags slow the speed of the driver's motion forward.
- Airbags absorb the energy of the car on collision.

#### 0 أحزمة الأمان :

تستخدم في السيارات للحفاظ على السائق والركاب من التحرك إلى الأمام عندما تتوقف السيارة فجأة، لذلك فأحزمة الأمان أنقذت آلاف الأرواح.

#### 🕡 الوسائد الهوائية :

#### تركيبها :

تصنع الوسائد الهوائية من مادة النابلون الحفيف وتكون مطوية في عجلة القيادة، أو المفاعد, أو لوحة التابلوه، أو الأبواب.

#### أهميتها :

- الوسائد الهوائية تقلل من سرعة حركة السائق للأمام.
- الوسائد الهوائية تمتص الطاقة الناتجة عن تصادم السيارة.

#### Activity 4 Page 289

#### Collision:

It is the moment where two objects hit or make contact in a forceful way.

#### التصادم:

39

هو اللحظة التي يصطدم فيها جسمان أو بلتحمان معًا بقوة.

#### Activity Page 292

 Measure the distance that both objects travel in the same amount of time.

The object that travels a greater distance in the same amount of time is moving at a greater speed.

Measure the time that both objects take to travel the same distance.The object that travels the same distance in a smaller amount of time is moving at a greater speed.

i. قياس المسافة التي يقطعها الجسمان في نفس الزمن.

الجسم الذي يقطع مساقة أكبر في نفس الفترة الزمنية هو الجسم الذي لديه سرعة أكبر،

٢. قياس الزمن الذي يقطع فيه الجسمان تفس المسافة.

الجسم الذي بقطع نفس المسافة في فترة زمنية أقل هو الجسم الذي لديه سرعة أكبر.

#### Activity 6 Page 293

- By increasing the speed of the object, the energy that transfers during collision will increase.
- Some of this transferred energy may be in the form of heat, light or sound.
  - عند زيادة سرعة الجسم، فإن الطاقة التي تنتفل أثناء التصادم تزداد.
  - بعض من هذه الطاقة المنتقلة يمكن أن تكون على صورة حرارة، أو ضوء، أو صوت.

#### Activity Page 296

- As the speed of a moving object increases, its kinetic energy increases.
- Both speed and kinetic energy increase, as the angle of inclination increases.
  - كلما زادت سرعة الجسم، زادت طاقة حركته.
  - تزداد السرعة وطاقة الحركة كلما زادت زاوية الميل.

#### Activity 8 Page 302

- As the force on an object increases, its speed and the amount of its kinetic energy increase.
- As the kinetic energy of a moving object increases, more damage will happen to this object during collision.
  - عند زيادة القوة المؤثرة على جسم، فإن سرعته تزداد وطاقته الحركية تزداد.
  - * كلما زادت طاقة الحركة لجسم متحرك، فإن مقدار التلف الذي سيحدث لهذا الجسم يزداد.

#### Activity 9 Page 303

# The relation between the mass of objects and their kinetic energy:

- Different vehicles have different masses, where a large truck has a much greater mass than a car.
- If a large truck is traveling at the same speed of a car, the truck has more kinetic energy than the car, so the truck needs a bigger engine than the car.
- As the vehicle moves faster, the amount of fuel that burns inside its engine increases to provide it with more kinetic energy.
- As the mass of an object increases, its kinetic energy increases.

#### العلاقة بين كتلة الأجسام وطاقة حركتها :

- المركبات المختلفة لها كتل مختلفة، حيث إن كتلة شاحنة كبيرة بكون أكبر من سيارة.
- إذا تحركت شاحنة كبيرة بنفس سرعة السيارة، فإن الشاحنة يكون لديها طاقة حركة أكبر من السيارة وبالنالى تحتاح الشاحنة لمحرك أكبر من السيارة.
- كلما زادت سرعة المركبة، كلما زادت كمبة الوقود التي تحترق داخل المحرك لنمد المركبة
   بطاقة حركة أكبر
  - كلما زادت كتلة الجسم، زادت طاقة حركته.

#### Activity 10 Pages 309 & 311

- The speed of the moving object on a ramp increases by increasing its mass.
- By increasing the mass of an object that moves down a ramp, the kinetic energy of this object increases.

• ترداد سرعة الجسم الذي يتحرك على متحدر، كلما زادت كتلة هذا الجسم.

• كلما زادت كتلة الجسم الذي يتحرك لأسفل على منحدر، كلما زادت طافة حركته

#### Activity 111 Page 317

#### Notes:

- 1. If you leave the moving balls of Newton's cradle long enough, their kinetic energy decreases gradually until they stop after lots of collisions.
- 2. Energy is conserved during collision, so it cannot be destroyed, but the amount of energy before the collision is equal to the amount of energy after the collision.

#### ملاحظات:

لَإِذَا تركت الكرات المتحركة في بندول نيوتن لفترة طويلة كافية، فإن طاقة حركة الكراث تقل تدريجيًا حتى تتوقف بعد عدة تصادمات

1.الطاقة نطل محفوظة أثناء التصادم، لذلك لا يمكن ندمبرها، ولكن كمية الطاقة قبل التصادم تساوي كمية الطافة بعد التصادم

NOTES :